10/065,037

07jul04 08:34:40 User259284 Session D2828.2

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200442
(c) 2004 Thomson Derwent

? ds

Set	Items	Description
S1	2	PN=(US 6433550 OR US 5519320)
S2	2538	AU=KAUFMAN?
S3	23	S2 AND SIMULAT???????
S4	0	S3 AND MOTION?
S5	0	S3 AND (MRI OR MAGNETIC()RESONANCE)
S6	34	AU=KAUFMAN? AND MOTION??
S7	1	S6 AND (MRI OR MAGNETIC()RESONANCE)
S8	130	AU=KAUFMAN L?
S9	0	S8 AND SIMULAT?????????
S10	2	S8 AND MOTION?

NPC STIC Search
July 7th 2004
Search Results

10/065,037

07jul04 08:34:40 User259284 Session D2828.2

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200442
(c) 2004 Thomson Derwent

```
Set     Items   Description
S1          2   PN=(US 6433550 OR US 5519320)
S2       2538   AU=KAUFMAN?
S3         23   S2 AND SIMULAT???????
S4          0   S3 AND MOTION?
S5          0   S3 AND (MRI OR MAGNETIC()RESONANCE)
S6         34   AU=KAUFMAN? AND MOTION??
S7          1   S6 AND (MRI OR MAGNETIC()RESONANCE)
S8        130   AU=KAUFMAN L?
S9          0   S8 AND SIMULAT?????????
S10         2   S8 AND MOTION?
S11         1   S10 NOT S7
S12         2   S1
```

07jul04 08:39:31 User259284 Session D2828.3

File 342:Derwent Patents Citation Indx 1978-04/200438
(c) 2004 Thomson Derwent

```
      Set  Items  Description
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Executing SD705
               2  PN=EP 1231477 + PN=EP 567794 + PN=JP 2002315736 + PN=JP
                  3396490 + PN=US 5519320 + PN=US 6433550
      S1       2  Serial: SD705
```

```
Set     Items   Description
S1          2   PN=EP 1231477 + PN=EP 567794 + PN=JP 2002315736 + PN=JP 33-
             96490 + PN=US 5519320 + PN=US 6433550
```

? b 342;ex
07jul04 08:41:57 User259284 Session D2828.6

File 342:Derwent Patents Citation Indx 1978-04/200438
(c) 2004 Thomson Derwent

```
      Set  Items  Description
      ---  -----  -----------
Executing SD705
               2  PN=EP 1231477 + PN=EP 567794 + PN=JP 2002315736 + PN=JP
                  3396490 + PN=US 5519320 + PN=US 6433550
      S1       2  Serial: SD705
? rank cg
Started processing RANK
Completed Ranking 2 records

Enter desired option(s) or enter RANK number(s) to save terms.
? 1-22
RANK numbers saved: 1-22
? exit


Creating temporary SearchSave ... TD259

? ex
Executing TD259
      S2     134  Serial: TD259
? rank pn cg
? exit
```

10/065,037

```
Set     Items   Description
S1          2   PN=EP 1231477 + PN=EP 567794 + PN=JP 2002315736 + PN=JP 33-
             96490 + PN=US 5519320 + PN=US 6433550
S2        134   S2:S23

Set     Items   Description
S1          2   PN=EP 1231477 + PN=EP 567794 + PN=JP 2002315736 + PN=JP 33-
             96490 + PN=US 5519320 + PN=US 6433550
S2        134   S2:S23
S3          2   S2 AND SIMULAT????????
S4          7   S2 AND (MOTION?????? OR MOVEMENT?)
S5         96   S2 AND (MR OR NMR OR MR OR MAGNETIC()RESONANCE)
S6         19   S2 AND IC=G01V?
S7          7   S2 AND COMPUTER?
S8          0   S2 AND INSTAB?
S9          2   S2 AND INHOMOGEN?
S10        44   S2 AND FIELD?
S11        14   5AND6
S12        32   5AND10
S13        10   6AND10
S14         0   S2 AND NONHOMOGEN?
S15         3   S2 AND MOV?????
S16         5   S2 AND VIBRAT??????
S17         1   S2 AND EDD??????
     S18      66  S3 OR S6 OR S4 OR S7:S17
     S19      20  S2 AND MRI
     S20      64  S18:S19 AND (MR OR NMR OR MRI OR MAGNETIC()RESONANCE)
     S21      11  S18:S19 AND (MOTION? OR MOVEMENT? OR SIMULA? OR MODEL?)
     S22      68  S20:S21
? map pn t

16 Select Statement(s), 206 Search Term(s)
Serial#TD260

1 SearchSaves,  206 Search Term(s)
? b 348 349 350 347 344 371;ex

       07jul04 08:48:34 User259284 Session D2828.7
SYSTEM:OS  - DIALOG OneSearch
  File 348:EUROPEAN PATENTS 1978-2004/Jun W03
         (c) 2004 European Patent Office
  File 349:PCT FULLTEXT 1979-2002/UB=20040701,UT=20040624
         (c) 2004 WIPO/Univentio
  File 350:Derwent WPIX 1963-2004/UD,UM &UP=200442
         (c) 2004  Thomson Derwent
  File 347:JAPIO Nov 1976-2004/Feb(Updated 040607)
         (c) 2004 JPO & JAPIO
*File 347: JAPIO data problems with year 2000 records are now fixed.
Alerts have been run.  See HELP NEWS 347 for details.
  File 344:Chinese Patents Abs Aug 1985-2004/May
         (c) 2004 European Patent Office
  File 371:French Patents 1961-2002/BOPI 200209
         (c) 2002 INPI.  All rts. reserv.
*File 371: This file is not currently updating. The last update is 200209.


Set     Items   Description
S1        144   S1:S15
S2          6   S1 AND SIMULA????????/TI,AB,CM
S3          0   S1 AND MODEL??????(3N)(MOTION???? OR MOVEMENT? OR EDD???? -
             OR TRANSLATION???? OR VIBRATION??? OR MOVE??? OR MOVING OR MO-
             VAB? OR MOVEAB?)
S4          0   S1 AND (MOTION?? OR MOVEMENT??)/TI,AB AND (SIMULAT? OR MOD-
             EL?)/TI,AB
S5          0   S1 AND (MOTION?? OR MOVEMENT??)/TI,AB AND (SIMULAT? OR MOD-
             EL?????)/TI,AB
```

10/065,037

07jul04 08:52:53 User259284 Session D2828.8

File 2:INSPEC 1969-2004/Jun W4
(c) 2004 Institution of Electrical Engineers

Set	Items	Description
S1	83189	COMPUTER??(3N)SIMULAT???????
S2	25210	COMPUTER??(3N)MODEL???
S3	28589	COMPUTER??(3N)MODEL?????
S4	733971	R1:R3 OR R20
S5	439468	R1:R2 OR R4 OR R6 OR R7 OR R9:R10
S6	1067	'HYBRID SIMULATION' (January 1977)
S7	3634	CC='C7000' Computer applications
S8	147338	R1:R9 OR MRI OR (NMR OR MAGNETIC()RESONANCE)(W)IMAG??????
S9	25827	(S1:S6 OR SIMULAT??????) AND S8
S10	23	7AND8
S11	12	S10 AND (SIMULA?????? OR MODEL??????)
S12	13596	(SIMULAT?????? OR MODEL????)(2N)(MOTION?? OR MOVE????? OR MOVING OR MOVAB? OR MOVEAB?)
S13	430	8AND12
S14	364	(S1:S7 OR S9:S11) AND S13
S15	72	S14 AND FIELD??
S16	2	S14 AND (MAGNETIC OR ELECTROMAGNETIC OR FIELD??)(3N)(INSTAB? OR UNSTAB? OR NONSTAB? OR STABILITY OR HOMOGEN? OR INHOMOGEN? OR NONHOMOGEN? OR UNIFORM? OR NONUNIFORM? OR UNUNIFORM?)
S17	2	15AND16
S18	1366	TRANSLATION????(3N)(SIMULA?????? OR MODEL????)
S19	25	8AND18
S20	20	(S1:S7 OR S9:S16) AND S19
S21	19	S20 NOT S17
S22	26961	(EQUIPMENT?? OR COMPONENT?? OR EDD???? OR VIBRATION????)(3N)(SIMULA??????? OR MODEL?????)
S23	391	8AND22
S24	87	S23 AND FIELD??
S25	4	S23 AND (MAGNETIC OR ELECTROMAGNETIC OR FIELD??)(3N)(INSTAB? OR UNSTAB? OR NONSTAB? OR STABILITY OR HOMOGEN? OR INHOMOGEN? OR NONHOMOGEN? OR UNIFORM? OR NONUNIFORM? OR UNUNIFORM?)
S26	3	23AND12
S27	7	S25:S26 NOT (S21 OR S17)

07jul04 09:07:49 User259284 Session D2829.2

File 34:SciSearch(R) Cited Ref Sci 1990-2004/Jun W4
(c) 2004 Inst for Sci Info

Set	Items	Description
S1	30	CR=STEWART BK, 1991?
S2	1	S1 AND SIMULA??????
S3	24	S1 AND (MRI OR IMAGE OR IMAGING OR IMAGED OR IMAGES)
S4	4	S3 AND MODEL???????
S5	1	AU=HAVENS TJ?
S6	1	CR=HAVENS TJ?
S7	2	S5:S6

7/9/1
DIALOG(R)File 350:Derwent WPIX

007095269
WPI Acc No: 1987-095266/198714
XRPX Acc No: N87-071592
Nuclear **magnetic resonance** imaging appts. - elicits lower spatial frequency image data, then higher frequency data in remainder of data acquisition cycle
Patent Assignee: UNIV CALIFORNIA (REGC)
Inventor: CROOKS L E; **KAUFMAN L**; ORTENDAHL D A
Number of Countries: 012 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 217196	A	19870408	EP 86112618	A	19860912	198714	B
US 4721912	A	19880126	US 85781735	A	19850930	198807	
EP 217196	B	19910925				199139	
DE 3681673	G	19911031				199145	

Priority Applications (No Type Date): US 85781735 A 19850930
Cited Patents: A3...8903; EP 127850; EP 130479; EP 212526; EP 218838; EP 73671; No-SR.Pub; US 4318043
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 217196	A	E	36		
Designated States (Regional): AT BE CH DE FR GB IT LI LU NL SE					
US 4721912	A		17		
EP 217196	B				
Designated States (Regional): AT BE CH DE FR GB IT LI LU NL SE					

Abstract (Basic): EP 217196 A

A projection reconstruction algorithm is employed to produce a visual image from the gathered NMR data and projection views of the patient or object are taken over a 180 degree segment, with successive projections at sequentially bisecting angles by controlling the gradient coil currents.

If Faurier transform irroging is employed, relative phase encoding which alternates in palonity and progressively increases in magnitude is used.

USE/ADVANTAGE - Medical. Earlier production of recognisable image permits aborting of cycle of early patient movement occurs.

1/13

Abstract (Equivalent): EP 217196 B

An NMR imaging apparatus comprising -NMR excitation means for eliciting plural successive NMR responses from an object to be imaged during a complete NMR image data acquisition cycle, NMR detection means for detecting and processing said NMR responses into digital signals representing an image of at least a portion of said object, said means for detecting and processing using a succession of phase-encoded responses in a Fourier-transform reconstruction technique, characterized in that said NMR excitation means including sequence control means for eliciting responses in a predetermined order which provides lower spatial frequency image data during an initial part of a data acquisition cycle and higher spatial frequency image data thereafter during the remaining part of said data acquisition cycle, said excitation means eliciting successive NMR responses using relative phase-encoding which alternates in polarity and progressively increases in magnitude, and said means for detecting and processing including image reconstruction means for accepting an initially occurring plurality of less than all of said NMR responses and for reconstructing an initial NMR image based thereon. (19pp)

Abstract (Equivalent): US 4721912 A

The NMR imaging appts. elicits NMR image response data in a predetermined order which provides the more significant lower spatial frequency image data during an initial portion of a relatively long complete image data acquisition cycle. The remaining higher spatial

frequency image data is captured during subsequent portions of the overall image data acquisition cycle. In this manner, apparent **motion** artifact in the resulting image is reduced.

Furthermore, such a special data acquisition sequence permits image reconstruction processes to produce a recognisable image at an earlier time in the complete data gathering cycle thus permitting a more timely image display for the appts. operator to use in monitoring and/or controlling the NMR image procedure. (17pp)e

Title Terms: NUCLEAR; MAGNETIC; RESONANCE; IMAGE; APPARATUS; ELICIT; LOWER; SPACE; FREQUENCY; IMAGE; DATA; HIGH; FREQUENCY; DATA; REMAINING; DATA; ACQUIRE; CYCLE
Derwent Class: S03; S05
International Patent Class (Additional): G01N-024/08; G01R-033/20
File Segment: EPI
Manual Codes (EPI/S-X): S03-E07; S05-D02X

11/9/1
DIALOG(R)File 350:Derwent WPIX

015228191 **Image available**
WPI Acc No: 2003-289104/200328
Related WPI Acc No: 2003-330879; 2003-330886
XRPX Acc No: N03-229928

Image scan self-gating method for coronary calcium measurement, involves calculating frequency and **motion** phase of heart based on size analysis of marked projection regions on overlapping slice images of patient's heart

Patent Assignee: ACCUIMAGE DIAGNOSTICS CORP (ACCU-N)
Inventor: GRIESS F; **KAUFMAN L**
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20030016851	A1	20030123	US 2001306311	P	20010717	200328 B
			US 2002159813	A	20020530	

Priority Applications (No Type Date): US 2001306311 P 20010717; US 2002159813 A 20020530
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20030016851	A1		26	G06K-009/00	Provisional application US 2001306311

Abstract (Basic): US 20030016851 A1

NOVELTY - A set of overlapping slice images of a patient's heart is acquired and a corresponding projection is generated. A region of the projection is marked and its size is analyzed to calculate heart frequency and phase of heart **motion** based on which a group of slice images are selected from the set of images, to generate groups of slices that correspond to different phases of heart **motion**.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) overlapping slice image gating method; and

(2) image data set Fourier gating method.

USE - For self-gating image scan obtained from CT scanner for use in coronary calcium measurement, 3-D reconstruction of heart such as CT angiography, heart function studies including dynamic studies.

ADVANTAGE - Improves calcium scoring and 3-D rendering of a patient's heart, by analyzing the slice images without using gating signal.

DESCRIPTION OF DRAWING(S) - The figure shows the flowchart of self gating a set of images.

pp; 26 DwgNo 1/17

Title Terms: IMAGE; SCAN; SELF; GATE; METHOD; CORONARY; CALCIUM; MEASURE; CALCULATE; FREQUENCY; **MOTION**; PHASE; HEART; BASED; SIZE; ANALYSE; MARK; PROJECT; REGION; OVERLAP; SLICE; IMAGE; PATIENT; HEART
Derwent Class: S03; S05; T01
International Patent Class (Main): G06K-009/00

1/9/1
DIALOG(R)File 350:Derwent WPIX

014789754 **Image available**
WPI Acc No: 2002-610460/200266
XRPX Acc No: N02-483442
Open magnetic resonance apparatus calculates compensation for changes in interpole spacing by analyzing vertical compressions experienced by pole assemblies
Patent Assignee: PHILIPS MEDICAL SYSTEMS TECHNOLOGIES LTD (PHIG); PHILIPS MEDICAL SYSTEMS ML TECHNOLOGIES (PHIG); KONINK PHILIPS CORP NV (PHIG)
Inventor: KINANEN I
Number of Countries: 028 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1231477	A1	20020814	EP 2002250959	A	20020212	200266	B
US 6433550	B1	20020813	US 2001782250	A	20010213	200266	
JP 2002315736	A	20021029	JP 200277276	A	20020213	200303	

Priority Applications (No Type Date): US 2001782250 A 20010213
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 1231477	A1	E	8	G01R-033/389	
	Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR				
US 6433550	B1			G01V-003/00	
JP 2002315736	A		22	A61B-005/055	

Abstract (Basic): EP 1231477 A1
NOVELTY - A spacing between the pole assemblies (16,18) expands and contracts with the vibrations caused by environmental disturbances. A force transducer (60) outputs voltage waveform indicative of vertical compressions experienced by the pole assemblies. A vibration analyzer (62) analyzes the waveform and calculates compensation for the changes in the interpole spacing. A reconstruction processor (52) compensates for the fluctuations.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for magnetic resonance imaging method.
USE - Open magnetic resonance apparatus. Also applicable to other open systems such as systems with H-shaped flux return paths, four poster arrangements, no ferrous flux return path, etc.
ADVANTAGE - Effectively reduces imaging artifacts while producing sharp contrast images. By compensating for the fluctuations, more uniform and stable main magnetic field is provided.
DESCRIPTION OF DRAWING(S) - The figure shows the magnetic resonance imaging system.
Pole assemblies (16,18)
Reconstruction processor (52)
Force transducer (60)
Vibration analyzer (62)
pp; 8 DwgNo 1/1
Title Terms: OPEN; MAGNETIC; RESONANCE; APPARATUS; CALCULATE; COMPENSATE; CHANGE; INTERPOLE; SPACE; VERTICAL; COMPRESS; EXPERIENCE; POLE; ASSEMBLE
Derwent Class: P31; S01; S03; T01
International Patent Class (Main): A61B-005/055; G01R-033/389; G01V-003/00
File Segment: EPI; EngPI
Manual Codes (EPI/S-X): S01-E02A2; S03-E07A; T01-J10C4B

1/9/2
DIALOG(R)File 350:Derwent WPIX

009652707 **Image available**
WPI Acc No: 1993-346257/199344
XRPX Acc No: N93-267445

Pulse sequence control in NMR imaging with high speed control - controls automatic generation of desired pulse sequence to be used interactively from base pulse sequence form and parameter block storing imaging parameters affected by specified conditions

Patent Assignee: TOSHIBA KK (TOKE)

Inventor: KANAYAMA S; KASSAI Y

Number of Countries: 005 Number of Patents: 004

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 567794	A2	19931103	EP 93105339	A	19930331	199344	B
EP 567794	A3	19931222	EP 93105339	A	19930331	199515	
US 5519320	A	19960521	US 9340857	A	19930331	199626	
JP 3396490	B2	20030414	JP 9277925	A	19920331	200328	

Priority Applications (No Type Date): JP 9277925 A 19920331

Cited Patents: No-SR.Pub; 4.Jnl.Ref; EP 195670; JP 3037044; US 4835690; WO 9100530

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 567794	A2	E	31	G01R-033/54	
Designated States (Regional): DE FR GB					
EP 567794	A3			G01R-033/54	
US 5519320	A		26	G01V-003/00	
JP 3396490	B2		19	A61B-005/055	Previous Publ. patent JP 5277085

Abstract (Basic): EP 567794 A

The method comprises the steps of storing the basic pulse sequence forms specifying pulse sequence parameters unaffected by imaging conditions for several pulse sequence types. Selecting one of the basic forms corresponding to a desired pulse sequence type. Storing parameters block containing pulse sequence parameters affected the imaging conditions.

Specifying the desired imaging conditions to update the parameters in the parameter block. Automatically generating a desired pulse sequence from one of the basic pulse sequence forms selected at the selecting step and the parameter block updated at the specifying step.

USE/ADVANTAGE - Medical, eg for imaging moving object such as heart. High speed imaging.

Dwg.1/21

Abstract (Equivalent): US 5519320 A

A method for pulse sequence control in a nuclear magnetic resonance imaging, comprising the steps of:

measuring characteristic parameters affecting a pulse sequence;

simulating an execution of the pulse sequence by using simulated RF pulses, simulated gradient magnetic fields, simulated static magnetic field, and simulated nuclear spin density distribution, according to the characteristic parameters measured at the measuring step, to obtain a result of a simulation as a spin motion and an echo signal resulting from the simulated RF pulses, the simulated gradient magnetic fields, the simulated static magnetic field, and the simulated nuclear spin density distribution; and

automatically adjusting the pulse sequence to an optimum setting according to the result of the simulation obtained at the simulating step.

Dwg.2

Title Terms: PULSE; SEQUENCE; CONTROL; NMR; IMAGE; HIGH; SPEED; CONTROL; CONTROL; AUTOMATIC; GENERATE; PULSE; SEQUENCE; INTERACT; BASE; PULSE; SEQUENCE; FORM; PARAMETER; BLOCK; STORAGE; IMAGE; PARAMETER; AFFECT; SPECIFIED; CONDITION

Index Terms/Additional Words: MRI

Derwent Class: P31; S01; S03; S05

International Patent Class (Main): A61B-005/055; G01R-033/54; G01V-003/00

International Patent Class (Additional): G01R-033/28

File Segment: EPI; EngPI

Manual Codes (EPI/S-X): S01-E02A; S01-H05; S03-E07A; S05-D02B2

? map pn

2/3,AB,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

013033036
WPI Acc No: 2000-204887/**200018**
Related WPI Acc No: 2003-539749
XRPX Acc No: N00-152446
Simulator for magnetic resonance imager has number of stages allowing data input to each major stage of imager in turn
Patent Assignee: FONAR CORP (FONA-N)
Inventor: HERTZ D; KNEPPER M B
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6025717	A	20000215	US 97880721	A	19970623	200018	B

Priority Applications (No Type Date): US 97880721 A 19970623
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6025717	A		12	G01V-003/00	

Abstract (Basic): **US 6025717** A
Abstract (Basic):
NOVELTY - The magnetic resonance imager (10) has magnetic (26,30) and radio (G) coils to generate signals from a body (B). The radio frequency signals are down converted (36), digitized (38) and digitally processed (20). A **simulator** (12) has magnetic coil (110), radio stage (106) D/A array (104), memory (86) and a sequence controller. A known correct digitized image is stored in the memory and can be fed into any of the main stages by switches (100,112,116) to generate a known image for diagnosis.
USE - Testing of magnetic resonance imager.
ADVANTAGE - Allows known images to be fed to the imager at any of its major stages so that each stage can be tested and identified as a source of errors.
DESCRIPTION OF DRAWING(S) - The drawing shows magnetic resonance imager **simulator**.
MRI unit (10)
Simulator (12)
Sequence linker (80)
Memory of known image (86)
D/A array to provide analog inputs (104)
Radio stage to provide radio inputs (106)
Magnetic coil stage (110)
Switches to direct **simulated** image to any stage (100,112,116)
pp; 12 DwgNo 1/4
Simulator for magnetic resonance imager has number of stages allowing data input to each major stage of imager in turn

Abstract (Basic): **US 6025717**
Abstract (Basic):
... radio (G) coils to generate signals from a body (B). The radio frequency signals are down converted (36), digitized (38) and digitally processed (20). A **simulator** (12) has magnetic coil (110), radio stage (106) D/A array (104), memory (86) and a sequence controller. A known correct digitized image is stored...
... The drawing shows magnetic resonance imager **simulator**.
...

...**Simulator** (12...

...Switches to direct **simulated** image to any stage (100,112,116

2/3,AB,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

012337980
WPI Acc No: 1999-144087/**199913**
XRPX Acc No: N99-104783
Device for modelling electromagnetic field emitted by electric devices - takes into account routing and type of any cabling within device to give more precise calculation of generated field
Patent Assignee: FUJITSU LTD (FUIT)
Inventor: MUKAI M; OHTSU S; TANAKA Y
Number of Countries: 003 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 19816097	A1	19990218	DE 1016097	A	19980409	199913	B
JP 11064412	A	19990305	JP 97217583	A	19970812	199920	
US 6285957	B1	20010904	US 9845125	A	19980320	200154	
JP 3405905	B2	20030512	JP 97217583	A	19970812	200333	

Priority Applications (No Type Date): JP 97217583 A 19970812
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 19816097	A1		37	G06F-017/00	
JP 11064412	A		26	G01R-029/08	
US 6285957	B1			G06F-009/455	
JP 3405905	B2		26	G01R-029/08	Previous Publ. patent JP 11064412

Abstract (Basic): DE 19816097 A
NOVELTY - The device uses a moment method, in which precise account is taken of any two-core cables that may be present and which may significantly alter the electromagnetic field of the whole device.
DETAILED DESCRIPTION - The device comprises an input unit (10), which permits the interactive input of characteristics and properties of any two-core cables present in the electrical device, e.g. cable entry, cable outlet, co-ordinates of the cable within the device, any socket points, etc. A library device (11) containing standard cables and their characteristic impedances, cable structure etc., model generator (13,14), etc. is included, to produce a model of the cable for use in a numerical **simulation** of the electrical device. A computer (15) is included, to calculate the field strength of the electrical device according to the model and the moment method.
USE - Determination of the electromagnetic field of an electric device using a computer **simulation** of the device and its cabling, as is required to meet national standards for electrical devices and their associated noise and radio-wave emission.
ADVANTAGE - Takes into account electrical cables connecting different parts of the device, which have previously been modelled as having fixed cable properties and cable routing.
DESCRIPTION OF DRAWING(S) - Figure is a block diagram of the device elements. (10) interactive input unit; (11) library device containing standard cable characteristics; (13,14) cable model generator; (15) computer for calculating field strengths.
Dwg.1/28

...Abstract (Basic): their characteristic impedances, cable structure etc., model generator (13,14), etc. is included, to produce a model of the cable for use in a numerical **simulation** of the electrical device. A computer (15) is included, to calculate the field strength of the electrical device according to the model and the moment...

...USE - Determination of the electromagnetic field of an electric device using a computer **simulation** of the device and its cabling, as is required to meet national standards for electrical devices and their associated noise and radio-wave emission...

2/3,AB,K/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

010124272
WPI Acc No: 1995-025523/**199504**
XRPX Acc No: N95-019896
Simulation method for emission noise in electronic components for reducing CAD time - estimating **simulation** for each wiring in circuit based upon input parameter required for **simulation** and output results to reducing number of wirings required NoAbstract
Patent Assignee: MITSUBISHI ELECTRIC CORP (MITQ)
Number of Countries: 001 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 6309420	A	19941104	JP 93101263	A	19930427	199504	B
JP 3047950	B2	20000605	JP 93101263	A	19930427	200032	

Priority Applications (No Type Date): JP 93101263 A 19930427
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 6309420	A		16	G06F-015/60	
JP 3047950	B2		17	G06F-017/50	Previous Publ. patent JP 6309420

Abstract (Basic): JP 6309420 A
Dwg.1/12
Simulation method for emission noise in electronic components for reducing CAD time...

...estimating **simulation** for each wiring in circuit based upon input parameter required for **simulation** and output results to reducing number of wirings required NoAbstract

2/3,AB,K/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX

007066209
WPI Acc No: 1987-066206/**198710**
XRPX Acc No: N87-050273
Nuclear magnetic resonance imaging appts. - uses switching of gradient fields without modulation and two- or three-dimensional Fourier process for image reconstruction
Patent Assignee: SIEMENS AG (SIEI)
Inventor: OPPELT A; GRAUMANN R
Number of Countries: 005 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 213436	A	19870311	EP 86110813	A	19860805	198710	B
US 4769603	A	19880906	US 86891965	A	19860801	198838	
EP 213436	B	19901031				199044	
DE 3675292	G	19901206				199050	

Priority Applications (No Type Date): DE 3608054 A 19860311; DE 3529629 A 19850819
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
EP 213436	A	G	12		
Designated States (Regional): DE FR GB NL					
US 4769603	A		9		
EP 213436	B				
Designated States (Regional): DE FR GB NL					

Abstract (Basic): EP 213436 A
The NMR appts. uses a number of coils (1,2,3,4,7,8) for providing a background in the vicinity of the examined object (5) which is also supplied with a sequence of HF pulses. The HF generator (9) and the gradient field coils (7,8) provide pulse sequences ensuring a dynamic

balanced magnetisation.

The gradient fields are unmodulated and are merely switched. Pref. the image reconstruction uses a 2-dimensional or 3-dimensional Fourier construction process.

ADVANTAGE - Allows rapid imaging.

1/4

Abstract (Equivalent): EP 213436 B

A method for operating a nuclear magnetic resonance apparatus for examining an object (5) with the aid of nuclear magnetic resonance, with coils (1, 2, 3, 4, 7, 8) for applying fundamental and gradient magnetic fields to the examination object (5), and a high frequency device (9, 16) which irradiates the examination object (5) with a series of high frequency pulses and which picks up nuclear resonance signals emitted from the examination object (5), image reconstruction being effected by filtered back-projetcion and the dynamic equilibrium magnetisation being maintained with the aid of switched unmodulated gradient fields through the following sequence: a) selective excitation of a slice of the examination object by **simulatenously** applying a slice selection gradient Gz for a duration T and a high ferquency pulse with a flip angle alpha (alpha is larger than 0 deg. and smaller than or equal to 90 deg. b) simultaneously application of a projection gradient -Gr and slice selection gradient -Gz for a duration of approzimately T/2. c) application of a projection gradient Gr and reading out the nuclear resonance signal emitted from the examination object for a duration of approximately T. d) - e) repeating the sequence (a) to (d) Nr times, but the directions of the projection gradient changed, until Nr scans are recorded, and from these an image can be obtained by Fourier transformation and filtered back-projection. (11pp)

Abstract (Equivalent): US 4769603 A

The method for operating a nuclear magnetic resonance apparatus uses coils to generate a fundamental magnetic field and gradient magnetic fields in which an examination subject is disposed. A transmitter/receiver generates a sequence of high-frequency pulses and acquires nuclear magnetic resonance signals from the examination subject operates the apparatus by simply switching the gradient fields, leaving the gradient fields unmodulated.

The pulse sequences generated by the pulse generator and by the gradient field coils are such that a dynamic equilibrium magnetisation is generated.

USE/ADVANTAGE - Rapid generation of tomographic image. (9pp)p

...Abstract (Equivalent): being maintained with the aid of switched unmodulated gradient fields through the following sequence: a) selective excitation of a slice of the examination object by **simulatenously** applying a slice selection gradient Gz for a duration T and a high ferquency pulse with a flip angle alpha (alpha is larger than 0...

2/3,AB,K/5 (Item 1 from file: 347)

DIALOG(R)File 347:JAPIO

06122875

INTENSITY CALCULATOR FOR ELECTROMAGNETIC FIELD AND PROGRAM RECORDING MEDIUM

PUB. NO.: 11-064412 A]
PUBLISHED: March 05, 1999 (19990305)
INVENTOR(s): TANAKA YOSHIRO
OTSU SHINICHI
MUKAI MAKOTO
APPLICANT(s): FUJITSU LTD
APPL. NO.: 09-217583 [JP 97217583]
FILED: August 12, 1997 (19970812)

ABSTRACT

PROBLEM TO BE SOLVED: To execute **simulation** matching to an actual object by making the location of a two wire cable being mounted on an electric circuit device freely variable when the intensity of electromagnetic field radiated from the electric circuit device is calculated through an arrangement using a moment method.

SOLUTION: A model generating means 13 generates a moment method model of an electric circuit device from the structural information thereof inputted from an input means 10. A generating means 14 finds the inductance and capacitance per unit length of a two-wire cable when the core thereof is present in the air. Characteristic impedance of the two-wire cable is calculated and the capacitance of a capacitor is determined by finding the capacitance per unit length of the two-wire cable. Since the location of the mounted two wire cable can be varied freely when the intensity of electromagnetic field radiated from the electric circuit device is calculated, **simulation** matching to an actual object can be executed.

ABSTRACT

PROBLEM TO BE SOLVED: To execute **simulation** matching to an actual object by making the location of a two wire cable being mounted on an electric circuit device freely variable when the...

... location of the mounted two wire cable can be varied freely when the intensity of electromagnetic field radiated from the electric circuit device is calculated, **simulation** matching to an actual object can be executed.

2/3,AB,K/6 (Item 2 from file: 347)
DIALOG(R)File 347:JAPIO

04637520
METHOD FOR **SIMULATING** RADIATION NOISE

PUB. NO.: 06-309420 [**JP 6309420** A]
PUBLISHED: November 04, 1994 (19941104)
INVENTOR(s): MIYAZAKI CHIHARU
EZAKI MITSUNOBU
OKA NAOHITO
APPLICANT(s): MITSUBISHI ELECTRIC CORP [000601] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 05-101263 [JP 93101263]
FILED: April 27, 1993 (19930427)

ABSTRACT

PURPOSE: To reduce the number of wirings for executing **simulation** and to shorten time required for **simulation** and design time by providing this **simulation** method with a function for judging the existence of **simulation** execution in each wiring.

CONSTITUTION: A parameter for judging the existence of **simulation** execution is inputted to a parameter input part 8 by an operator or read out from a data base 7. For example, clock frequency, the waveform, amplitude, rise time, fall time of each signal, duty, wiring length, the dielectric constant of a base, and the thickness of a dielectric substance are used as parameters. The function 10 for judging the existence of **simulation** execution judges the existence of **simulation** execution in each wiring by using these parameters. A radiation noise **simulation** executing part 11 applies radiation noise **simulation** to wiring whose **simulation** necessity is judged.

METHOD FOR **SIMULATING** RADIATION NOISE

ABSTRACT

PURPOSE: To reduce the number of wirings for executing **simulation** and to shorten time required for **simulation** and design time by providing this **simulation** method with a function for judging the existence of **simulation** execution in each wiring...

...CONSTITUTION: A parameter for judging the existence of **simulation** execution is inputted to a parameter input part 8 by an operator or read out from a data base 7. For example, clock frequency, the...

... the dielectric constant of a base, and the thickness of a dielectric substance are used as parameters. The function 10 for judging the existence of **simulation** execution judges the existence of **simulation** execution in each wiring by using these parameters. A radiation noise **simulation** executing part 11 applies radiation noise **simulation** to wiring whose **simulation** necessity is judged.

17/9/1
DIALOG(R)File 2:INSPEC

6195068 INSPEC Abstract Number: A1999-08-8760I-038, B1999-04-7510N-073, C1999-04-7330-268
Title: Automatic suppression of spatially variant translational motion artifacts in **magnetic resonance imaging**
Author(s): Kadah, Y.M.; Xiaoping Hu
Author Affiliation: Dept. of Biomed. Eng., Cairo Univ., Giza, Egypt
Conference Title: Proceedings 1998 International Conference on Image Processing. ICIP98 (Cat. No.98CB36269) Part vol.1 p.24-8 vol.1
Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA
Publication Date: 1998 Country of Publication: USA 3 vol. (lxxi+962+984+1013) pp.
ISBN: 0 8186 8821 1 Material Identity Number: XX-1998-01745
U.S. Copyright Clearance Center Code: 0 8186 8821 1/98/$10.00
Conference Title: Proceedings of IPCIP'98 International Conference on Image Processing
Conference Sponsor: IEEE Signal Process. Soc
Conference Date: 4-7 Oct. 1998 Conference Location: Chicago, IL, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T)
Abstract: This paper summarizes the theory of a novel post-processing approach to automatic motion artifact suppression in **magnetic resonance imaging** . The main advantage of the new approach is its treatment of practical spatially variant translational **motion model** that is fundamentally different from previous work in the literature. We first consider a 1-D model for the problem based on differentiated rather than original image. In this **model**, the **motion** artifact amounts to blurring of peaks corresponding to the edges in the original image. Observing that the distorted and true images share the same 2-norm, we search for the true image on the hyper-sphere with radius equal to this norm. We show that the solution must have the minimum 1-norm of all vectors on the hyper-sphere and a search strategy based on dynamic programming is used to estimate the motion at a reasonable complexity. Subsequently, this procedure is applied to different regions in the image independently and spatially variant **motion model** parameters are derived at a resolution of the region sizes. Finally, we show the similarity between this problem and the problem of **magnetic field inhomogeneity** distortion. Based on this similarity, an image reconstruction strategy and an expression for the point-spread function of the resultant image are derived. The new technique is applied to correct **computer simulated** images and promising results are obtained. (5 Refs)
Subfile: A B C
Descriptors: **biomedical MRI**; **diagnostic radiography**; dynamic programming; image reconstruction; image resolution; motion estimation; optical transfer function; search problems
Identifiers: automatic suppression; spatially variant translational motion artifacts; **magnetic resonance imaging**; post-processing approach; 1D **motion model**; hyper-sphere; radius ; minimum 1-norm; search strategy; dynamic programming; image regions; **motion model** parameters; image resolution; **magnetic field inhomogeneity** distortion; image reconstruction; point-spread function; **computer simulated** images correction
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); B7510N (Biomedical magnetic resonance imaging and spectroscopy); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)

17/9/2
DIALOG(R)File 2:INSPEC

02773983 INSPEC Abstract Number: A86124015, B86070534
Title: A two-dimensional synthetic aperture radar **imaging simulation** of **moving** ocean waves
Author(s): Wakasugi, K.; Kishi, N.; Matsuo, M.
Author Affiliation: Dept. of Electr. Eng., Kyoto Inst. of Technol., Japan
Conference Title: ISAP Japan 1985. Proceedings of the 1985 International Symposium on Antennas and Propagation, Japan - A Step to New Radio Frontiers p.643-6 vol.2
Publisher: Inst. Electron. Commun. Eng. Japan, Tokyo, Japan
Publication Date: 1985 Country of Publication: Japan 3 vol. (viii+ix+x+1141) pp.
Conference Date: 20-22 Aug. 1985 Conference Location: Kyoto, Japan
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T)
Abstract: An analytical model of the ocean surface SAR images with a more realistic three-dimensional framework is presented under the assumption that a trochoidal swell propagates through a **uniform field** of Bragg-type distributed scatterers. Two-dimensional SAR images are calculated for the interpretation and prediction of actual SAR images of the ocean surface as a function of ocean wave amplitude, wave frequency, propagation direction and radar frequency, off-nadir angle of the antenna, and spatial resolutions. (10 Refs)
Subfile: A B
Descriptors: ocean waves; oceanographic techniques; radar applications; remote sensing
Identifiers: measurement; technique; remote sensing; two-dimensional synthetic aperture radar **imaging simulation**; moving ocean waves ; analytical model; ocean surface SAR images; trochoidal swell; Bragg-type distributed scatterers; ocean wave amplitude; wave frequency; propagation direction; radar frequency; off-nadir angle; spatial resolutions
Class Codes: A9210H (Surface waves, tides, and sea level); A9385 (Instrumentation and techniques for geophysical research); B6320 (Radar systems and equipment); B7710D (Oceanographic and hydrographic measurement techniques and equipment)

21/9/1
DIALOG(R)File 2:INSPEC

7851202 INSPEC Abstract Number: A2004-05-8760I-019, B2004-03-7510N-018
Title: Novel prospective respiratory motion correction approach for free-breathing coronary MR angiography using a patient-adapted affine **motion model**
Author(s): Manke, D.; Nehrke, K.; Bornert, P.
Author Affiliation: Sector Tech. Sys., Philips Res. Lab., Hamburg, Germany
Journal: Magnetic Resonance in Medicine vol.50, no.1 p.122-31
Publisher: Wiley,
Publication Date: July 2003 Country of Publication: USA
CODEN: MRMEEN ISSN: 0740-3194
SICI: 0740-3194(200307)50:1L.122:NPRM;1-0
Material Identity Number: K620-2003-007
U.S. Copyright Clearance Center Code: 0740-3194/2003/$3.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Theoretical (T)
Abstract: A novel technique is presented which enables the calibration of a 3D affine respiratory **motion model** to the individual motion pattern of the patient. The concept of multiple navigators and precursory navigators is introduced to address nonlinear properties and hysteresis effects of the model parameters with respect to the conventional diaphragmatic navigator. The optimal combination and weighting of the navigators is determined on the basis of a principal component analysis (PCA). Thus, based on a given navigator measurement the current motion state of the object can be predicted by means of the calibrated **motion model**. The 3D **motion model** is applied in

high-resolution coronary MR angiography examinations (CMRA) to prospectively correct for respiration-induced motion. The basic feasibility of the proposed calibration procedure was shown in 16 volunteers. Furthermore, the application of the calibrated **motion model** for CMRA examinations of the right coronary artery (RCA) was tested in 10 volunteers. The superiority of a calibrated 3D **translation model** over the conventional 1D **translation model** with a fixed correction factor and the potential of affine prospective motion correction for CMRA are demonstrated. (30 Refs)

Subfile: A B

Descriptors: angiocardiography; **biomedical MRI**; **blood**; calibration; hysteresis; physiological **models**; pneumodynamics; principal component analysis

Identifiers: respiratory motion correction; free-breathing coronary MR angiography; patient-adapted affine **motion model**; 3D affine respiratory **motion model**; precursory navigators; hysteresis effects; diaphragmatic navigator; optimal weighting; principal component analysis; PCA; current motion; 3D **motion model**; respiration-induced motion; CMRA examinations; right coronary artery; 3D **translation model**; 1D **translation model**; correction factor

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8770E (Patient diagnostic methods and instrumentation); A8745H (Haemodynamics, pneumodynamics); A0250 (Probability theory, stochastic processes, and statistics); A8710 (General, theoretical, and mathematical biophysics); B7510N (Biomedical magnetic resonance imaging and spectroscopy); B0240Z (Other topics in statistics)

21/9/2

DIALOG(R)File 2:INSPEC

7570273 INSPEC Abstract Number: A2003-09-8760K-005, B2003-05-7510R-003, C2003-05-7330-047

Title: Determining velocity displacement field from cardiac image sequence

Author(s): Meyering, W.I.; Gutierrez, M.A.; Robilotta, C.C.; Furuie, S.S.

Author Affiliation: Heart Inst. (InCor), Univ. of Sao Paulo Med. Sch. Hosp., Brazil

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4683 p.176-85

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 2002 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(2002)4683L.176:DVDF;1-0

Material Identity Number: C574-2002-236

U.S. Copyright Clearance Center Code: 0277-786X/02/$15.00

Conference Title: Medical Imaging 2002: Physiology and Function from Multidimensional Images

Conference Sponsor: SPIE

Conference Date: 24-26 Feb. 2002 Conference Location: San Diego, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: Estimation of left ventricle motion and deformation from series of images has been an area of attention in the medical image analysis and still remains an open and challenging problem. Left ventricle contractile abnormalities can be an important manifestation of coronary artery disease. The proper motion tracking of left ventricle wall can contribute to isolate the location and extent of ischemic or infarcted myocardium and constitutes a fundamental goal of image modalities, such as Nuclear Medicine. This work describes a method to automatically estimate the velocity vector field for a beating heart based on the study of variation in frequency content in a series of 2D images as time varies. The frequency analysis is performed by

computing the Wigner-Ville and the Choi-Williams distributions to each image pixel, yielding the corresponding 3D-frequency spectrum. From this 3D spectrum the local velocity of each pixel is calculated by employing a multiple linear regression model. Experimental validation was carried out using synthetic phantoms that **simulate translation** and rotation between successive frames. Results obtained from gated SPECT perfusion studies are also presented. (12 Refs)

Subfile: A B C

Descriptors: biomechanics; cardiology; image sequences; medical image processing; radioisotope **imaging**; single photon emission computed tomography; vectors; velocity measurement

Identifiers: Wigner-Ville distribution; Choi-Williams distribution; cardiac image; velocity displacement field; nuclear medicine; gated SPECT perfusion studies; medical diagnostic **imaging**; coronary artery disease; ischemic myocardium; beating heart; frequency content; multiple linear regression model; synthetic phantoms; translation; rotation; successive frames; infarcted myocardium; left ventricle wall motion tracking

Class Codes: A8760K (Nuclear medicine, emission tomography); A8770E (Patient diagnostic methods and instrumentation); A8745D (Physics of body movements); B7510R (Nuclear medicine, emission tomography); B6135 (Optical, image and video signal processing); B7320E (Velocity, acceleration and rotation measurement); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)

21/9/3

DIALOG(R)File 2:INSPEC

7494895 INSPEC Abstract Number: A2003-04-8760I-004, B2003-02-7510N-050, C2003-02-7330-200

Title: Model evaluation and calibration for prospective respiratory motion correction in coronary MR angiography based on 3-D image registration

Author(s): Manke, D.; Rosch, P.; Nehrke, K.; Bornert, P.; Dossel, O.

Author Affiliation: Inst. of Biomed. Eng., Univ. of Karlsruhe, Germany

Journal: IEEE Transactions on Medical Imaging vol.21, no.9 p. 1132-41

Publisher: IEEE,

Publication Date: Sept. 2002 Country of Publication: USA

CODEN: ITMID4 ISSN: 0278-0062

SICI: 0278-0062(200209)21:9L.1132:MECP;1-9

Material Identity Number: C904-2003-001

U.S. Copyright Clearance Center Code: 0278-0062/02/$17.00

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T); Experimental (X)

Abstract: Image processing was used as a fundamental tool to derive motion information from magnetic resonance (MR) images, which was fed back into prospective respiratory motion correction during subsequent data acquisition to improve image quality in coronary MR angiography (CMRA) scans. This reduces motion artifacts in the images and, in addition, enables the usage of a broader gating window than commonly used today to increase the scan efficiency. The aim of the study reported in this paper was to find a suitable **motion model** to be used for respiratory motion correction in cardiac **imaging** and to develop a calibration procedure to adapt the **motion model** to the individual patient. At first, the performance of three **motion models** [one-dimensional **translation** in feet-head (FH) direction, three-dimensional (3-D) translation, and 3-D affine transformation] was tested in a small volunteer study. An elastic image registration algorithm was applied to 3-D MR images of the coronary vessels obtained at different respiratory levels. A strong intersubject variability was observed. The 3-D **translation** and affine transformation **model** were found to be superior over the conventional FH **translation model** used today. Furthermore, a new approach is presented, which utilizes a fast model-based image registration to extract motion information from time series of

low-resolution 3-D MR images, which reflects the respiratory motion of the heart. The registration is based on a selectable global 3-D **motion model** (**translation** , rigid, or affine transformation). All 3-D MR images were registered with respect to end expiration. The resulting time series of model parameters were analyzed in combination with additionally acquired motion information from a diaphragmatic MR pencil-beam navigator to calibrate the respiratory **motion model** . To demonstrate the potential of a calibrated **motion model** for prospective **motion** correction in coronary **imaging**, the approach was tested in CMRA examinations in five volunteers. (27 Refs)

Subfile: A B C

Descriptors: angiocardiography; **biomedical MRI**; **calibration**; image registration; medical image processing; motion compensation; physiological **models**; time series

Identifiers: model evaluation; respiratory motion correction; coronary MR angiography; 3-D image registration; model parameters time series; small volunteer study; feet-head direction; selectable global 3-D **motion model**; end expiration; scan efficiency increase; motion information extraction; 3-D affine transformation; intersubject variability; fast model-based image registration; motion information derivation

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); A8710 (General, theoretical, and mathematical biophysics); A8745D (Physics of body movements); B7510N (Biomedical magnetic resonance imaging and spectroscopy); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)

21/9/4

DIALOG(R)File 2:INSPEC

6949286 INSPEC Abstract Number: A2001-14-8760M-014, B2001-07-7530B-035

Title: **Modelling** the dosimetric consequences of organ motion at CT **imaging** on radiotherapy treatment planning

Author(s): Booth, J.T.; Zavgorodni, S.F.

Author Affiliation: Dept. of Phys. & Math. Phys., Adelaide Univ., SA, Australia

Journal: Physics in Medicine and Biology vol.46, no.5 p.1369-77

Publisher: IOP Publishing,

Publication Date: May 2001 Country of Publication: UK

CODEN: PHMBA7 ISSN: 0031-9155

SICI: 0031-9155(200105)46:5L.1369:MDCO;1-J

Material Identity Number: P117-2001-005

U.S. Copyright Clearance Center Code: 0031-9155/2001/051369+09$30.00

Document Number: S0031-9155(01)15766-0

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T); Experimental (X)

Abstract: Treatment planning algorithms usually assume that the correct or at least the mean organ position is derived from the CT **imaging** procedure, and that this position is reproduced throughout the treatment. In reality a mobile organ is unlikely to be in its exact mean position at the time of **imaging** , causing the treatment to be planned with an organ off-set from its assumed mean position, This introduces an extra "CT uncertainty" into the treatment. A Monte Carlo (MC) model is used to **simulate** organ **translations** at **imaging** and evaluate the effect of this uncertainty (above the treatment delivery uncertainties) on the dose distribution. An underdose by 4 Gy in a 60 Gy treatment is calculated in the penumbral region of a single-field dose distribution as a result of the CT uncertainty. The effect is reduced to less then 0.5 Gy when the organ position at planning is derived as the average from multiple pretreatment CT scans. It is shown that a convolution method can be applied to predict the effect of CT uncertainty on the dose distribution for a patient population. Additionally, a variation kernel for a convolution method is derived that incorporates uncertainty at both **imaging** and

treatment. (15 Refs)
Subfile: A B
Descriptors: biological organs; biomechanics; computerised tomography; dosimetry; Monte Carlo methods; physiological **models**; radiation therapy
Identifiers: treatment planning algorithms; mean organ position; computerised tomography **imaging** procedure; mobile organ; computerised tomography uncertainty; Monte Carlo model; organ translations; treatment delivery uncertainties; underdose; penumbral region; single-field dose distribution; multiple pretreatment CT scans; convolution method; patient population; variation kernel; organ motion; dosimetric consequences; **modelling**; radiotherapy treatment planning
Class Codes: A8760M (Radiation dosimetry in medical physics); A8770H (Radiation therapy); A8770E (Patient diagnostic methods and instrumentation); A8760J (X-rays and particle beams (medical uses)); A8710 (General, theoretical, and mathematical biophysics); A8745D (Physics of body movements); B7530B (Radiation protection and dosimetry); B7520C (Radiation therapy); B7510P (X-ray techniques: radiography and computed tomography (biomedical imaging/measurement))

21/9/5
DIALOG(R)File 2:INSPEC

6690237 INSPEC Abstract Number: C2000-10-7330-188
Title: The computerized 3D-model surgery **simulator** - introduction of a new system
Author(s): Santler, G.
Author Affiliation: Dept. of Oral Maxillofacial Surg., Graz Univ., Austria
Conference Title: CARS'99 Computer Assisted Radiology and Surgery. Proceedings of the 13th International Congress and Exhibition p.908-12
Editor(s): Lemke, H.U.; Vannier, M.W.; Inamura, K.; Farman, A.G.
Publisher: Elsevier Science, Amsterdam, Netherlands
Publication Date: 1999 Country of Publication: Netherlands xlvi+1111 pp.
ISBN: 0 444 50290 4 Material Identity Number: XX-1999-01139
Conference Title: Proceedings of 13th International Symposium on Computer Assisted Radiology and Surgery (CARS'99)
Conference Date: 23-26 June 1999 Conference Location: Paris, France
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P)
Abstract: A new developed computerized system for **simulation** surgery on CT- or **MRI**-based 3D skull **models** is introduced. After replacement of the dental arches of the 3D-model by plaster casts, a 3D digitizer is used to locate the reference points on the **model**. A **computer** software package analyses symmetry and cephalometric measurements. Electromagnetic 6D trackers, attached to the **model**, measure the **translations** and rotations of the osteotomized bone segments during **simulation** surgery. This data is transferred online to a PC, displaying the movements graphically and numerically. For intra-operative positioning of the segments according to the **simulation** , a mechanical transfer device is applied, enabling high precision (SD = 0.144 mm, range=-0.36 to 0.69 mm). This system makes exact **simulation** surgery and precise intra-operative positioning possible. (15 Refs)
Subfile: C
Descriptors: analogue-digital conversion; biomedical measurement; **biomedical MRI**; **bone**; computerised tomography; **digital simulation**; **medical computing**; position control; surgery; symmetry
Identifiers: computerized 3D model surgery **simulator**; CT-based 3D skull **models**; **MRI**-based 3D skull **models**; computerized tomography; dental arch replacement; plaster casts; 3D digitizer; reference point location; computer software package; symmetry; cephalometric measurements; electromagnetic 6D trackers; translation measurement;

rotation measurement; osteotomized bone segments; personal computer; graphical display; numerical display; intraoperative positioning; mechanical transfer device; precision

Class Codes: C7330 (Biology and medical computing); C5180 (A/D and D/A convertors); C3120C (Spatial variables control); C3385 (Biological and medical control systems); C7420 (Control engineering computing); C5260B (Computer vision and image processing techniques)

21/9/6
DIALOG(R)File 2:INSPEC

6674406 INSPEC Abstract Number: A2000-18-8760K-034, B2000-09-7510R-048, C2000-09-7330-338

Title: Effects of upward creep and respiratory motion in myocardial SPECT

Author(s): Tsui, B.M.W.; Segars, W.P.; Lalush, D.S.

Author Affiliation: Dept. of Biomed. Eng., North Carolina Univ., Chapel Hill, NC, USA

Journal: IEEE Transactions on Nuclear Science Conference Title: IEEE Trans. Nucl. Sci. (USA) vol.47, no.3, pt.3 p.1192-5

Publisher: IEEE,

Publication Date: June 2000 Country of Publication: USA

CODEN: IETNAE ISSN: 0018-9499

SICI: 0018-9499(200006)47:3:3L.1192:EUCR;1-G

Material Identity Number: I047-2000-010

U.S. Copyright Clearance Center Code: 0 7803 5696 9/2000/$10.00

Conference Title: 1999 IEEE Nuclear Science Symposium. Conference Record. 1999 IEEE Nuclear Science Symposium and Medical Imaging Conference

Conference Date: 24-30 Oct. 1999 Conference Location: Seattle, WA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: In this study, the authors investigate the effects of two patient involuntary motions, namely upward creep (UC) and respiratory (RSP) motion, in myocardial SPECT images. A new realistic torso phantom was developed based on data from the Visual Human Project and using non-uniform rational B-splines (NURBS) **modeling**. The heart and diaphragm of the phantom move with a linear upward **translation** to **model** UC and **move** in a sinusoidal up and down fashion to **model** RSP **motion**. **Simulated** emission and transmission CT data sets were generated from the phantom using a L-shaped dual-camera SPECT system with a radioactivity distribution **modeling** that of a Tl-210 study with UC of 2 cm. The effects of attenuation and collimator-detector response are included in the **simulation**. A patient study with the same extent of UC was used for comparison. Both **simulated** and patient data were reconstructed with and without correction for attenuation and UC. Similar data sets were generated from the phantom with RSP **motion**. The **simulated** reconstructed images demonstrated distinct UC and RSP artifacts in the inferior region of the myocardium. The UC artifact can be greatly reduced with simple UC correction. However, the correction of RSP artifact may require respiratory gating. (12 Refs)

Subfile: A B C

Descriptors: biomechanics; cardiology; medical image processing; motion compensation; muscle; physiological **models**; single photon emission computed tomography; splines (mathematics

Identifiers: myocardial SPECT; upward creep; respiratory motion; patient involuntary motions; realistic torso phantom; Visual Human Project; nonuniform rational B-splines **modeling**; transmission CT data sets; Tl-210 study; nuclear medicine; medical diagnostic **imaging**; linear upward translation; diaphragm; phantom; radioactivity distribution **modeling**; 2 cm; Tl

Class Codes: A8760K (Nuclear medicine, emission tomography); A8770E (Patient diagnostic methods and instrumentation); A8745D (Physics of body movements); B7510R (Nuclear medicine, emission tomography); B6135 (Optical, image and video signal processing); C7330 (Biology and medical

computing); C5260B (Computer vision and image processing techniques)
Chemical Indexing:
Tl el (Elements - 1)
Numerical Indexing: distance 2.0E-02 m

21/9/7
DIALOG(R)File 2:INSPEC

6670360 INSPEC Abstract Number: A2000-18-8760J-030, B2000-09-7510P-063, C2000-09-7330-272
Title: 3D orientations of catheters from single projections
Author(s): Esthappan, J.; Hoffmann, K.R.
Author Affiliation: Dept. of Radiol., Chicago Univ., IL, USA
Conference Title: Computer-Aided Diagnosis in Medical Imaging. Proceedings of the First International Workshop on Computer-Aided Diagnosis p.357-61
Editor(s): Doi, K.; MacMahon, H.; Giger, M.L.; Hoffmann, K.R.
Publisher: Elsevier Science, Amsterdam, Netherlands
Publication Date: 1999 Country of Publication: Netherlands xii+563 pp.
ISBN: 0 444 50058 8 Material Identity Number: XX-1999-03031
Conference Title: Proceedings of the First International Workshop on Computer Aided Diagnosis in Medical Imaging
Conference Date: 20-23 Sept. 1998 Conference Location: Chicago, IL, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T); Experimental (X)
Abstract: Currently, interventionists guide catheters through the vasculature using fluoroscopic images. However, three-dimensional (3D) information may facilitate catheter guidance as well as decrease patient morbidity. The authors have developed a technique that may facilitate visualization of the catheter in 3D using a single projection image and may, thereby, simplify interventional procedures. After images are acquired, unique points along the catheter are identified in the images and their correspondences with points in a catheter model are established. After an initial positioning, the model is rotated and translated iteratively until the projections of the points in the model align optimally with their corresponding points in the image data. Once aligned, the 3D position and orientation of the catheter relative to the **imaging** system are calculated. **Simulation** studies for catheters of diameters 0.18 and 0.32 cm indicate that the accuracies of the calculated orientations and positions were approximately 3 degrees and 0.5 cm, respectively. Phantom studies indicate that the reproducibilities of the calculated orientations and positions were approximately 2 degrees and 0.3 cm, respectively. These results indicate that this technique may provide accurate 3D information for interventional procedures. (9 Refs)
Subfile: A B C
Descriptors: biomedical equipment; blood vessels; diagnostic radiography; iterative methods; medical image processing
Identifiers: catheter 3D orientations; single projections; fluoroscopic images; patient morbidity; unique points; model rotation; **model translation**; align optimally; interventional procedures; phantom studies; reproducibility; medical diagnostic **imaging**; 0.18 cm; 0.32 cm
Class Codes: A8760J (X-rays and particle beams (medical uses)); A8770E (Patient diagnostic methods and instrumentation); B7510P (X-ray techniques: radiography and computed tomography (biomedical imaging/measurement)); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)
Numerical Indexing: size 1.8E-03 m; size 3.2E-03 m

21/9/8
DIALOG(R)File 2:INSPEC

6651754 INSPEC Abstract Number: B2000-08-6135-331, C2000-08-5260B-439
Title: A geometric approach to blind deconvolution with application to shape from defocus
Author(s): Soatto, S.; Favaro, P.
Author Affiliation: Washington Univ., St. Louis, MO, USA
Conference Title: Proceedings IEEE Conference on Computer Vision and Pattern Recognition. CVPR 2000 (Cat. No.PR00662) Part vol.2 p.10-17 vol.2
Publisher: IEEE Comput. Soc, Los Alamitos, CA, USA
Publication Date: 2000 Country of Publication: USA 2 vol.(xxii+846+804) pp.
ISBN: 0 7695 0662 3 Material Identity Number: XX-2000-01571
U.S. Copyright Clearance Center Code: 1063-6919/2000/$10.00
Conference Title: Proceedings IEEE Conference on Computer Vision and Pattern Recognition. CVPR 2000
Conference Sponsor: IEEE Comput. Soc.; IEEE Comput. Soc. Tech. Committee on Pattern Anal. & Machine Intelligence
Conference Date: 13-15 June 2000 Conference Location: Hilton Head Island, SC, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T)
Abstract: We propose a solution to the generic "bilinear calibration-estimation problem" when using a quadratic cost function and restricting to (locally) **translation**-invariant **imaging models** . We apply the solution to the problem of reconstructing the three-dimensional shape and radiance of a scene from a number of defocused images. Since the **imaging** process maps the continuum of three-dimensional space onto the discrete pixel grid, rather than discretizing the continuum we exploit the structure of maps between (finite-and infinite-dimensional) Hilbert spaces and arrive at a principled algorithm that does not involve any choice of basis or discretization. Rather, these are uniquely determined by the data, and exploited in a functional singular value decomposition in order to obtain a regularized solution. (20 Refs)
Subfile: B C
Descriptors: image reconstruction; singular value decomposition
Identifiers: blind deconvolution; shape from defocus; bilinear calibration-estimation; quadratic cost function; translation-invariant **imaging**; reconstructing; defocused images; singular value decomposition
Class Codes: B6135 (Optical, image and video signal processing); B0210 (Algebra); C5260B (Computer vision and image processing techniques); C1110 (Algebra)

21/9/9
DIALOG(R)File 2:INSPEC

6249134 INSPEC Abstract Number: A1999-12-8760I-034, B1999-06-7510N-070, C1999-06-7330-311
Title: Linear motion correction in three dimensions applied to dynamic gadolinium enhanced breast **imaging**
Author(s): Krishnan, S.; Chenevert, T.L.; Helvie, M.A.; Londy, F.L.
Author Affiliation: Dept. of Radiat. Oncology, Michigan Univ., Ann Arbor, MI, USA
Journal: Medical Physics vol.26, no.5 p.707-14
Publisher: AIP for American Assoc. Phys. Med,
Publication Date: May 1999 Country of Publication: USA
CODEN: MPHYA6 ISSN: 0094-2405
SICI: 0094-2405(199905)26:5L.707:LMCT;1-Z
Material Identity Number: M190-1999-004

U.S. Copyright Clearance Center Code: 0094-2405/99/26(5)/707/8/$15.00
Document Number: S0094-2405(99)01005-6
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: Quantitative analysis of dynamic gadolinium-DTPA (diethylenetriamine pentaacetic acid) enhanced **magnetic resonance imaging** (**MRI**) is emerging as a highly sensitive tool for detecting malignant breast tissue. Three-dimensional rapid **imaging** techniques, such as keyhole **MRI**, yield high temporal sampling rates to accurately track contrast enhancement and washout in lesions over the course of multiple volume acquisitions. Patient motion during the dynamic acquisitions is a limiting factor that degrades the image quality, particularly of subsequent subtraction images used to identify and quantitatively evaluate regions suggestive of malignancy. Keyhole **imaging** is particularly sensitive to motion since datasets acquired over an extended period are combined in k-space. In this study, **motion** is **modeled** as set of **translations** in each of the three orthogonal dimensions. The specific objective of the study is to develop and implement an algorithm to correct the consequent phase shifts in k-space data prior to offline keyhole reconstruction three-dimensional (3D) volume breast MR acquisitions. (29 Refs)
Subfile: A B C
Descriptors: **biomedical MRI**; **cancer**; gadolinium; image enhancement; image reconstruction; mammography; medical image processing; motion compensation
Identifiers: breast neoplasms; dynamic acquisitions; k-space; orthogonal dimensions; offline keyhole reconstruction; post-processing algorithms; 3D volume breast MR acquisitions; keyhole **imaging**; contrast enhancement; **MRI**; malignant breast tissue detection; image quality degradation; medical diagnostic **imaging**; linear motion correction; Gd
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); B7510N (Biomedical magnetic resonance imaging and spectroscopy); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)
Chemical Indexing:
Gd el (Elements - 1)

21/9/10
DIALOG(R)File 2:INSPEC

6076299 INSPEC Abstract Number: A9824-8760B-024, B9812-7510B-287, C9812-7330-273
Title: Experimental observation of speckle motion artifact with rotation
Author(s): Dupont, S.; Bertrand, M.; Hall, T.; Cyr, M.; Kallel, F.
Author Affiliation: Inst. de Genie Biomed., Ecole Polytech. de Montreal, Que., Canada
Conference Title: Acoustical Imaging. Vol.23 p.315-20
Editor(s): Lees, S.; Ferrair, L.A.
Publisher: Plenum Press, New York, NY, USA
Publication Date: 1997 Country of Publication: USA xvi+653 pp.
ISBN: 0 306 45768 7 Material Identity Number: XX98-02562
Conference Title: Acoustical Imaging. Vol.23
Conference Date: 13-16 April 1997 Conference Location: Boston, MA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Experimental (X)
Abstract: Ultrasound speckles may move in a way that bears no simple relationship to the motion of the corresponding tissue. In some instances, the speckle motion does not replicate the underlying tissue motion and has a strong artifactual component. Kallel et al. (1994) proposed an image formation model to explain the motion artifact under tissue rotation. We are now validating this model by **imaging** a rotating phantom with a linear array. For a rotating tissue, the model predicts an apparent

movement composed of the expected rotation plus a strong horizontal **translation**. The **model** explains this **translation** by the nonlinear phase characteristics which originate from the curvature of the system point spread function (PSF). In the far field, the translation artifact is proportional to the scan depth and the rotation angle. Using a correlation method to compute the displacement field, we can determine the amplitude of the motion artifact. This paper reports on an experimental validation of the **motion** artefact **model** predictions. (1 Refs)

Subfile: A B C

Descriptors: acoustic correlation; biomedical ultrasonics; image reconstruction; image sequences; medical image processing; motion compensation; motion estimation; speckle

Identifiers: speckle motion artifact with rotation; ultrasound speckles; image formation model; tissue rotation; rotating phantom; linear array; apparent movement; expected rotation; strong horizontal translation; nonlinear phase characteristics; point spread function; translation artifact; far field; correlation method; displacement field; **motion** artefact **model** predictions; volume reconstruction; image sequences; motion compensation

Class Codes: A8760B (Sonic and ultrasonic radiation (medical uses)); A8770E (Patient diagnostic methods and instrumentation); A4360 (Acoustic signal processing); B7510B (Radiation and radioactivity applications in biomedicine); B7820 (Sonic and ultrasonic applications); B6140C (Optical information, image and video signal processing); C7330 (Biology and medical computing); C1250 (Pattern recognition); C5260B (Computer vision and image processing techniques)

21/9/11
DIALOG(R)File 2:INSPEC

6075306 INSPEC Abstract Number: A9824-8760I-009, B9812-7510B-264, C9812-7330-252

Title: Correction of head movements in multi-slice EPI and single-slice gradient-echo functional **MRI**

Author(s): Singh, M.; Al-Dayeh, L.; Patel, P.; Kim, T.; Guclu, C.; Nalcioglu, O.

Author Affiliation: Univ. of Southern California, Los Angeles, CA, USA

Conference Title: 1997 IEEE Nuclear Science Symposium Conference Record (Cat. No.97CH36135) Part vol.2 p.1354-6 vol.2

Editor(s): Nalcioglu, O.

Publisher: IEEE, New York, NY, USA

Publication Date: 1997 Country of Publication: USA 2 vol. xlviii+1761 pp.

ISBN: 0 7803 4258 5 Material Identity Number: XX98-01257

U.S. Copyright Clearance Center Code: 0 7803 4258 5/98/$10.00

Conference Title: 1997 IEEE Nuclear Science Symposium Conference Record

Conference Date: 9-15 Nov. 1997 Conference Location: Albuquerque, NM, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P)

Abstract: The authors have investigated 2D and 3D registration techniques based on either simple rotational/**translational movements** or **movements modeled** as a first or second order polynomial to correct for assumed rigid and nonrigid body motion in fMRI. Data acquired with two different multi-slice echo planar **imaging** (EPI) systems and a single-slice conventional gradient-echo system (all at 1.5 T) were used to develop and evaluate the registration techniques. Two sets of data were acquired with EPI. In the first set, the subjects were asked to keep their head as stationary as possible while in the second set, subjects were asked to randomly move their head with displacements being on the order of 1 cm. Images from the second set were registered and compared to those obtained from the first set. Results show that 2D and 3D motion corrected images show lower variance to mean ratio than uncorrected images and that in most cases, polynomial based nonrigid body correction produces the lowest

variance to mean ratios. (2 Refs)
Subfile: A B C
Descriptors: biomechanics; biomedical NMR; image registration; medical image processing; polynomials
Identifiers: multi-slice EPI; single-slice gradient-echo functional **MRI**; head movements correction; uncorrected images; 3D motion corrected images; 2D motion corrected images; variance to mean ratio; **magnetic resonance imaging**; medical diagnostic **imaging**; 1 cm; 1.5 T
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); A8745D (Physics of body movements); B7510B (Radiation and radioactivity applications in biomedicine); B6140C (Optical information, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)
Numerical Indexing: distance 1.0E-02 m; magnetic flux density 1.5E+00 T

21/9/12
DIALOG(R)File 2:INSPEC

6018607 INSPEC Abstract Number: A9820-8760I-010, B9810-7510B-143, C9810-7330-160
Title: Correction for head movements in multi-slice EPI functional **MRI**
Author(s): Singh, M.; Al-Dayeh, L.; Patel, P.; Kim, T.; Guclu, C.; Nalcioglu, O.
Author Affiliation: South Carolina Univ., Columbia, SC, USA
Journal: IEEE Transactions on Nuclear Science Conference Title: IEEE Trans. Nucl. Sci. (USA) vol.45, no.4, pt.2 p.2162-7
Publisher: IEEE,
Publication Date: Aug. 1998 Country of Publication: USA
CODEN: IETNAE ISSN: 0018-9499
SICI: 0018-9499(199808)45:4:2L.2162:CHMM;1-C
Material Identity Number: I047-98011
U.S. Copyright Clearance Center Code: 0018-9499/98/$10.00
Conference Title: 1997 Medical Imaging Conference (MIC)
Conference Date: 13-15 Nov. 1997 Conference Location: Albuquerque, NM, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: The authors have investigated 2D and 3D registration techniques based on either simple rotational/**translational movements** or **movements modeled** as a first or second order polynomial to correct for assumed rigid and nonrigid body motion in fMRI. Data acquired with two 1.5 T multi-slice echo planar **imaging** (EPI) systems were used to develop and evaluate registration techniques. Two sets of data were acquired with EPI. In the first set, the subjects were asked to keep their head as stationary as possible while in the second set, subjects were asked to randomly move their head with displacements being on the order of 1 cm. Images from the second set were registered and compared to those obtained from the first set. Results indicate that 2D and 3D motion corrected images show lower variance to mean ratio than uncorrected images and that in most cases, polynomial based nonrigid body correction produces the lowest variance to mean ratios. (18 Refs)
Subfile: A B C
Descriptors: biomechanics; biomedical NMR; image registration; medical image processing
Identifiers: head movements correction; multislice EPI functional **MRI**; 3D registration techniques; 2D registration techniques; simple rotational/translational movements; second order polynomial; first order polynomial; nonrigid body motion; rigid body motion; random head movements; uncorrected images; **magnetic resonance imaging**; medical diagnostic **imaging**; 1.5 T

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8770E (Patient diagnostic methods and instrumentation); A8745D (Physics of body movements); A8740 (Biomagnetism); B7510B (Radiation and radioactivity applications in biomedicine); B6140C (Optical information, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)
Numerical Indexing: magnetic flux density 1.5E+00 T

21/9/13
DIALOG(R)File 2:INSPEC

5777766 INSPEC Abstract Number: A9802-8715B-011
Title: The in situ architecture of Escherichia coli ribosomal RNA derived by electron spectroscopic **imaging** and three-dimensional reconstruction
Author(s): Beniac, D.R.; Czarnota, G.J.; Rutherford, B.L.; Ottensmeyer, F.P.; Harauz, G.
Author Affiliation: Dept. of Molecular Biol. & Genetics, Guelph Univ., Ont., Canada
Journal: Journal of Microscopy vol.188, pt.1 p.24-35
Publisher: Blackwell Science for R. Microsc. Soc,
Publication Date: Oct. 1997 Country of Publication: UK
CODEN: JMICAR ISSN: 0022-2720
SICI: 0022-2720(199710)188:1L.24:SAEC;1-4
Material Identity Number: J224-97010
U.S. Copyright Clearance Center Code: 0022-2720/97/$14.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)
Abstract: The structures of the large and small ribosomal subunits of Escherichia coli were reconstructed using spectroscopic electron microscopy and quaternion-assisted angular reconstitution to resolutions of better than 4 nm. In addition, the distributions of phosphorus within these complexes were reconstructed. The three-dimensional reconstruction of the distribution of this atomic element is an extension of microanalysis (in two dimensions) for phosphorus identification and mapping, as a signature of the arrangement of the phosphate backbones of the constituent ribosomal RNAs. The results on both the phosphorus reconstructions and the total reconstructions (protein and ribosomal RNA) reveal several passageways through both subunits. The structures correspond favourably with other independent reconstructions of the whole E. Coli ribosome from cryoelectron micrographs and their accompanying **models** of **translation** (Frank et al., Nature, 376, 441-4, 1995; Stark et al., Structure, S, 815-21, 1995). The overall reconstructions in conjunction with the phosphorus (rRNA) distributions are the first to be achieved synchronously for this nucleoprotein complex. (77 Refs)
Subfile: A
Descriptors: biological techniques; electron microscopy; image resolution ; macromolecules; molecular biophysics; proteins
Identifiers: in situ architecture; Escherichia coli; ribosomal RNA; electron spectroscopic **imaging**; three-dimensional reconstruction; ribosomal subunits; spectroscopic electron microscopy; quaternion-assisted angular reconstitution; resolutions; phosphorus distributions; atomic element; microanalysis; mapping; phosphate backbones; protein; cryoelectron micrographs; nucleoprotein complex
Class Codes: A8715B (Biomolecular structure, configuration, conformation, and active sites); A0780 (Electron and ion microscopes and techniques); A8715M (Interactions with radiations at the biomolecular level); A3620C (Macromolecular conformation (statistics and dynamics)); A8780 (Biophysical instrumentation and techniques)

21/9/14
DIALOG(R)File 2:INSPEC

5565067 INSPEC Abstract Number: A9711-8710-007, B9706-7510B-046, C9706-7330-053

Title: Model based estimation of point correspondences between boundaries undergoing nonrigid motion [digital mammography application]

Author(s): Kumar, S.; Kambhamettu, C.; Goldgof, D.; Sallam, M.

Conference Title: Proceedings. International Conference on Image Processing (Cat. No.96CH35919) Part vol.1 p.359-62 vol.1

Publisher: IEEE, New York, NY, USA

Publication Date: 1996 Country of Publication: USA 3 vol. (xlviii+1029+1067+1073) pp.

ISBN: 0 7803 3259 8 Material Identity Number: XX96-02020

U.S. Copyright Clearance Center Code: 0 7803 3258 X/96/$5.00

Conference Title: Proceedings of 3rd IEEE International Conference on Image Processing

Conference Sponsor: IEEE Signal Process. Soc

Conference Date: 16-19 Sept. 1996 Conference Location: Lausanne, Switzerland

Language: English Document Type: Conference Paper (PA)

Treatment: Theoretical (T); Experimental (X)

Abstract: Proposes a method for the estimation of point correspondences between boundaries undergoing nonrigid motion. The algorithm works in two stages. In the first stage, a global estimate of the nonrigid motion is obtained using hyperquadric **models** . The second stage uses this estimate to remove the global nonrigid motion (scale, shear, etc.) and then compute point correspondences between the two datasets assuming small deformations. The global part of the nonrigid motion (scale, shear, rotation and **translation**) is estimated by **modeling** the object with hyperquadrics and estimating the transformation between the hyperquadric parameters. Point correspondences are then estimated by using differential geometric properties during small deformations. Experimental results with real data are presented. (10 Refs)

Subfile: A B C

Descriptors: diagnostic radiography; medical image processing; **modelling**; motion estimation

Identifiers: point correspondences; model based estimation; mammograms; boundaries undergoing nonrigid motion; scale; shear; rotation; translation; hyperquadrics; digital mammography; X-ray images; breast cancer detection; medical diagnostic **imaging**

Class Codes: A8710 (General, theoretical, and mathematical biophysics); A8760J (X-rays and particle beams (medical uses)); A8770E (Patient diagnostic methods and instrumentation); B7510B (Radiation and radioactivity applications in biomedicine); B6140C (Optical information, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)

21/9/15

DIALOG(R)File 2:INSPEC

4997710 INSPEC Abstract Number: A9515-8760I-019, B9508-7510B-142

Title: Motion artifact correction of **MRI** via iterative inverse problem solving

Author(s): Yen-Hao Tseng; Jenq-Neng Hwang; Chun Yuan

Author Affiliation: Dept. of Electr. Eng., Washington Univ., Seattle, WA, USA

Conference Title: Proceedings ICIP-94 (Cat. No.94CH35708) Part vol.1 p.871-5 vol.1

Publisher: IEEE Comput. Soc. Press, Los Alamitos, CA, USA

Publication Date: 1994 Country of Publication: USA 3 vol. (liii+992+1064+1050) pp.

ISBN: 0 8186 6952 7

U.S. Copyright Clearance Center Code: 0 8186 6950 0/94/$4.00

Conference Title: Proceedings of 1st International Conference on Image

Processing
Conference Sponsor: IEEE Signal Process. Soc
Conference Date: 13-16 Nov. 1994 Conference Location: Austin, TX, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T); Experimental (X)
Abstract: Motion of the subject during magnetic resonance scan produces artifacts in the reconstructed images, which appear as blurring and ghost repetitions of the moving structures for the 2-dimensional Fourier Transform **imaging** methods. Several mathematical techniques have been proposed to correct the motion artifacts. Those techniques usually assume some types of **motion models** such as **translational** motion, rotational motion or linear expansion. In reality, motion can be far more complex, thus those techniques can be applied only in very limited cases. We present a new iterative algorithm to correct the corrupted data. Our method can be generalized to any arbitrary **motion**. The **computer simulations** demonstrate that a significant amount of improvement in motion artifact correction is achieved using this algorithm. (7 Refs)
Subfile: A B
Descriptors: biomedical NMR; Fourier transforms; image reconstruction; inverse problems; iterative methods; medical image processing; motion estimation
Identifiers: iterative inverse problem solving; motion artifact correction; **MRI**; magnetic resonance scan; reconstructed images; blurring; ghost repetitions; moving structures; 2-D Fourier Transform **imaging** methods; mathematical techniques; **motion models**; translational motion; rotational motion; linear expansion; corrupted data correction; arbitrary motion; **computer simulations**
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8770E (Patient diagnostic methods and instrumentation); A0260 (Numerical approximation and analysis); A8740 (Biomagnetism); B7510B (Radiation and radioactivity applications in biomedicine); B6140C (Optical information, image and video signal processing); B0290F (Interpolation and function approximation)

21/9/16
DIALOG(R)File 2:INSPEC

4982015 INSPEC Abstract Number: A9514-8760J-015, C9508-7330-048
Title: Preliminary study on helical CT algorithms for patient motion estimation and compensation
Author(s): Ge Wang; Vannier, M.W.
Author Affiliation: Mallinckrodt Inst. of Radiol., Washington Univ. Sch. of Med., St. Louis, MO, USA
Journal: IEEE Transactions on Medical Imaging vol.14, no.2 p.205-11
Publication Date: June 1995 Country of Publication: USA
CODEN: ITMID4 ISSN: 0278-0062
U.S. Copyright Clearance Center Code: 0278-0062/95/$04.00
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: Helical computed tomography (helical/spiral CT) has replaced conventional CT in many clinical applications. In current helical CT, a patient is assumed to be rigid and motionless during scanning and planar projection sets are produced from raw data via longitudinal interpolation. However, rigid patient: motion is a problem in some cases (such as in the skull base and temporal bone **imaging**). Motion artifacts thus generated in reconstructed images can prevent accurate diagnosis. **Modeling** a uniform **translational** movement, the authors address how patient motion is ascertained and how it may be compensated. First, mismatch between adjacent fan-beam projections of the same orientation is determined via classical correlation, which is approximately proportional to the patient displacement projected onto an axis orthogonal to the central ray of the involved fan-beam. Then, the patient motion vector (the patient displacement per gantry rotation) is estimated from its projections using a least-square-root method. To suppress motion artifacts, adaptive

interpolation algorithms are developed that synthesize full-scan and half-scan planar projection data sets, respectively. In the adaptive scheme, the interpolation is performed along inclined paths dependent upon the patient **motion** vector. The **simulation** results show that the patient motion vector can be accurately and reliably estimated using the authors' correlation and least-square-root algorithm, patient motion artifacts can be effectively suppressed via adaptive interpolation, and adaptive half-scan interpolation is advantageous compared with its full-scan counterpart in terms of high contrast image resolution. (19 Refs)

Subfile: A C

Descriptors: biomechanics; computerised tomography; medical image processing; motion estimation

Identifiers: helical CT algorithms; patient motion estimation; patient motion compensation; helical computed tomography; medical diagnostic **imaging**; rigid motionless patient; skull base **imaging**; temporal bone **imaging**; motion artifacts; reconstructed images; adjacent fan-beam projections mismatch; patient displacement; patient motion vector; gantry rotation; least-square-root algorithm; adaptive interpolation; half-scan interpolation; high contrast image resolution

Class Codes: A8760J (X-rays and particle beams (medical uses)); A8770E (Patient diagnostic methods and instrumentation); A8745D (Physics of body movements); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques)

21/9/17

DIALOG(R)File 2:INSPEC

4518750 INSPEC Abstract Number: A9324-8760G-007, B9312-7510B-036, C9312-7330-069

Title: Restoration of MR images corrupted with translational motion

Author(s): Hedley, M.; Hong Yan

Author Affiliation: Dept. of Electr. Eng., Sydney Univ., NSW, Australia

Conference Title: ICIP 92. Proceedings of the 2nd Singapore International Conference on Image Processing p.649-52

Editor(s): Srinivasa, V.; Ong Sim Heng; Ang Yew Hock

Publisher: World Scientific, Singapore

Publication Date: 1992 Country of Publication: Singapore xxii+734 pp.

ISBN: 981 02 1182 1

Conference Date: 7-11 Sept. 1992 Conference Location: Singapore

Language: English Document Type: Conference Paper (PA)

Treatment: Theoretical (T)

Abstract: Patient motion during magnetic resonance data acquisition causes artifacts in the reconstructed image that obscure anatomic details. While most papers on the subject have attempted to minimise the corruption of the data, this paper takes the corrupted data and treats this as a restoration problem. The effects of **translational motion** are **modelled**, and it is shown that motion within the **imaging** plane corrupts the phase of the data, and motion perpendicular to the **imaging** plane corrupts the magnitude of the data. The proposed restoration algorithm is an iterative algorithm based on projection operators onto constraint sets. The algorithm has been tested using numerical **simulations** and found to perform well. (10 Refs)

Subfile: A B C

Descriptors: biomedical NMR; image reconstruction; iterative methods; medical image processing

Identifiers: image restoration; **magnetic resonance imaging**; **MRI**; patient motion; image reconstruction; translational motion; artifacts; corrupted data; iterative algorithm; projection operators; constraint sets; numerical **simulations**

Class Codes: A8760G (Laser beams, microwaves, and other electromagnetic waves); A8770E (Diagnostic methods and instrumentation); B7510B (Radiation and radioactivity applications); B6140C (Optical information and image processing); B0290F (Interpolation and function approximation); C7330 (

Biology and medicine); C5260B (Computer vision and picture processing)

21/9/18
DIALOG(R)File 2:INSPEC

04346448 INSPEC Abstract Number: A9306-8760G-011, B9303-7510B-055, C9303-5260B-110
Title: Iterative restoration of MR images corrupted with translational motion
Author(s): Hedley, M.; Yan, H.
Author Affiliation: Dept. of Electr. Eng., Sydney Univ., NSW, Australia
Journal: Journal of Visual Communication and Image Representation vol.3, no.4 p.325-37
Publication Date: Dec. 1992 Country of Publication: USA
CODEN: JVCRE7 ISSN: 1047-3203
U.S. Copyright Clearance Center Code: 1047-3203/92/$5.00
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)
Abstract: Patient motion during the acquisition of **magnetic resonance imaging** data causes loss of resolution and ghost repetitions of the moving structures in the reconstructed image. The **motion** is **modeled** as being **translational**, and it is shown that this causes either the magnitude or the phase of the data to be corrupted, depending upon whether the motion is within or perpendicular to the **imaging** plane. The problem of restoring the image using only the corrupted data and no knowledge about the motion is addressed. The restoration problem is nonlinear in general, but is linear in two special cases. An iterative algorithm is developed that uses projections onto convex sets for magnitude retrieval and generalized projections for phase retrieval. In both cases constraint sets containing all a priori knowledge are used, and this is shown to be necessary for rapid convergence. The two algorithms may be combined to restore images corrupted by three-dimensional motion. The algorithms were verified using **simulated** data. (39 Refs)
Subfile: A B C
Descriptors: biomedical NMR; convergence of numerical methods; image reconstruction; iterative methods
Identifiers: iterative restoration; patient motion; MR images; translational motion; **magnetic resonance imaging** data; iterative algorithm; projections; convex sets; magnitude retrieval; phase retrieval; constraint sets; convergence
Class Codes: A8760G (Laser beams, microwaves, and other electromagnetic waves); A8740 (Biomagnetism); A8770E (Diagnostic methods and instrumentation); A0260 (Numerical approximation and analysis); B7510B (Radiation and radioactivity applications); B6140C (Optical information and image processing); B0290F (Interpolation and function approximation); C5260B (Computer vision and picture processing); C7330 (Biology and medicine)

21/9/19
DIALOG(R)File 2:INSPEC

04227039 INSPEC Abstract Number: A9219-8760J-037
Title: Misalignment between PET transmission and emission scans: its effect on myocardial **imaging**
Author(s): McCord, M.E.; Bacharach, S.L.; Bonow, R.O.; Dilsizian, V.; Cuocolo, A.; Freedman, N.
Author Affiliation: Nat. Inst. of Health, Bethesda, MD, USA
Journal: Journal of Nuclear Medicine vol.33, no.6 p.1209-14
Publication Date: June 1992 Country of Publication: USA
CODEN: JNMEAQ ISSN: 0161-5505
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Experimental (X)
Abstract: Patient movement between PET scanning sequences can produce

misalignment between attenuation and emission scans. Such misalignment introduces errors in the emission image. This study evaluates the severity of these errors and their effect upon quantitation of regional myocardial activity. Myocardial FDG scans from 14 patients were reconstructed with **simulated translational** , rotational and out-of-plane patient movement. Eight myocardial regions from each patient were examined to determine the effect such misalignment might have on regional myocardial activity. A 2-cm shift between attenuation and emission scans produced up to a 30% change in regional activity. Some regions of the myocardium increased while others decreased for a given magnitude and direction of shift, producing anomalous regional myocardial inhomogeneities in the image. Such changes could easily cause qualitative and quantitative misinterpretations. The authors present data permitting the reader to assess the magnitude of this effect in his/her own clinical setting. (6 Refs)

Subfile: A

Descriptors: cardiology; computerised tomography; muscle; radioisotope scanning and **imaging**

Identifiers: patient movement; nuclear medicine; medical diagnostic **imaging**; PET emission scan; PET transmission scan; myocardial **imaging**; regional myocardial activity; anomalous regional myocardial inhomogeneities

Class Codes: A8760J (Corpuscular radiation and radioisotopes); A8770E (Diagnostic methods and instrumentation)

27/9/1
DIALOG(R)File 2:INSPEC

7156303 INSPEC Abstract Number: A2002-05-8760I-003, B2002-02-7510N-074, C2002-02-7330-340

Title: Retrospective correction of MR intensity inhomogeneity by information minimization

Author(s): Likar, B.; Viergever, M.A.; Pernus, F.

Author Affiliation: Dept. of Electr. Eng., Ljubljana Univ., Slovenia

Journal: IEEE Transactions on Medical Imaging vol.20, no.12 p. 1398-410

Publisher: IEEE,

Publication Date: Dec. 2001 Country of Publication: USA

CODEN: ITMID4 ISSN: 0278-0062

SICI: 0278-0062(200112)20:12L.1398:RCII;1-2

Material Identity Number: C904-2002-001

U.S. Copyright Clearance Center Code: 0278-0062/01/$10.00

Document Number: S0278-0062(01)11140-7

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: In this paper, the problem of retrospective correction of intensity **inhomogeneity** in **magnetic** resonance (MR) images is addressed. A novel model-based correction method is proposed, based on the assumption that an image corrupted by intensity inhomogeneity contains more information than the corresponding uncorrupted image. The image degradation process is described by a linear model, consisting of a multiplicative and an additive **component** which are **modeled** by a combination of smoothly varying basis functions. The degraded image is corrected by the inverse of the image degradation model. The parameters of this model are optimized such that the information of the corrected image is minimized while the global intensity statistic is preserved. The method was quantitatively evaluated and compared to other methods on a number of simulated and real MR images and proved to be effective, reliable, and computationally attractive. The method can be widely applied to different types of MR images because it solely uses the information that is naturally present in an image, without making assumptions on its spatial and intensity distribution. Besides, the method requires no preprocessing, parameter setting, nor user interaction. Consequently, the proposed method may be a valuable tool in MR image analysis. (37 Refs)

Subfile: A B C

Descriptors: **biomedical MRI; medical image processing;** minimisation; modelling

Identifiers: retrospective MR intensity inhomogeneity correction; information minimization; **magnetic resonance imaging;** nonuniformity correction; parameter setting; user interaction; MR image analysis; image degradation model; model parameters; smoothly varying basis functions; global intensity statistic preservation; model-based correction method; corrupted image; medical diagnostic **imaging**

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); A8710 (General, theoretical, and mathematical biophysics); B7510N (Biomedical magnetic resonance imaging and spectroscopy); B6135 (Optical, image and video signal processing); B0260 (Optimisation techniques); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques); C1180 (Optimisation techniques)

27/9/2

DIALOG(R)File 2:INSPEC

7082292 INSPEC Abstract Number: A2001-24-8750-002

Title: Numerical computation of distortions in magnetic fields and induced currents in physiological solutions produced by microscope objectives

Author(s): Chatterjee, I.; Hassan, N.; Craviso, G.L.; Publicover, N.G.

Author Affiliation: Dept. of Electr. Eng., Nevada Univ., Reno, NV, USA

Journal: Bioelectromagnetics vol.22, no.7 p.463-9

Publisher: Wiley-Liss for Bioelectromagn. Soc,

Publication Date: Oct. 2001 Country of Publication: USA

CODEN: BLCTDO ISSN: 0197-8462

SICI: 0197-8462(200110)22:7L.463:NCDM;1-E

Material Identity Number: A804-2001-008

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: Identifying distortions produced by commonly employed microscope objectives and their components in uniform DC and 60 Hz AC magnetic fields is important in **imaging** studies involving exposure of cells to spatially **uniform** or **nonuniform magnetic fields** . In this study, DC and 60 Hz AC magnetic flux densities were numerically computed in the presence of finite element **models** of various **components** of commonly utilized microscope objectives, as well as a model of a complete objective. Also computed were the distortions in the current density induced by an applied time-varying magnetic field in a physiological buffer contained within a Petri dish. The authors show that the magnetic flux density could be increased up to 65% in the presence of the nickel-chrome plating of an objective housing and that the presence of ferromagnetic components like a screw or spring could produce peaks that are 7% higher than the undistorted value of magnetic flux density. In addition, a slight tilt of 1% in the objective with respect to the magnetic field could cause a 93% deviation in magnetic flux density from the unperturbed value. These results correlate well with previously published experimental measurements that showed the presence of significant and sometimes asymmetric distortions in both DC and 60 Hz magnetic fields. Moreover, this study further re ports that induced current density changed up to 37% compared to values in the absence of the objective. The existence of distortions in applied magnetic fields and induced currents could affect the interpretation of results of cell function studies if it is assumed that the cells are exposed to **uniform magnetic** flux densities in the presence of a microscope objective. Such assumptions of **uniform magnetic** flux density could also account for the lack of reproducibility in several studies that examined changes in intracellular calcium by **imaging** techniques. (9 Refs)

Subfile: A

Descriptors: bioelectric phenomena; biological effects of fields; biological techniques; cellular effects of radiation; finite element analysis; lenses; magnetic field effects; optical microscopes

Identifiers: distortions numerical computation; induced currents; physiological solutions; microscope objectives; 60 Hz AC magnetic fields; **uniform** DC **magnetic fields**; physiological buffer; Petri dish; time-varying magnetic field; nickel-chrome plating; 60 Hz; Ca; Ni-Cr
Class Codes: A8750 (Biological effects of radiations); A0260 (Numerical approximation and analysis); A4280A (Optical lenses and mirrors); A0760P (Optical microscopy); A8780 (Biophysical instrumentation and techniques); A8710 (General, theoretical, and mathematical biophysics); A8728 (Bioelectricity); A8725 (Cellular biophysics)
Chemical Indexing:
Ca el (Elements - 1)
NiCr bin - Cr bin - Ni bin (Elements - 2)
Numerical Indexing: frequency 6.0E+01 Hz

27/9/3
DIALOG(R)File 2:INSPEC

7032108 INSPEC Abstract Number: A2001-20-8770G-002, B2001-10-7520-024
Title: Knee surgery assistance: patient **model** construction, **motion simulation**, and biomechanical visualization
Author(s): Chen, J.X.; Wechsler, H.; Pullen, J.M.; Ying Zhu; MacMahon, E.B.
Author Affiliation: Dept. of Comput. Sci., George Mason Univ., Fairfax, VA, USA
Journal: IEEE Transactions on Biomedical Engineering vol.48, no.9 p.1042-52
Publisher: IEEE,
Publication Date: Sept. 2001 Country of Publication: USA
CODEN: IEBEAX ISSN: 0018-9294
SICI: 0018-9294(200109)48:9L.1042:KSAP;1-K
Material Identity Number: I050-2001-009
U.S. Copyright Clearance Center Code: 0018-9294/2001/$10.00
Document Number: S0018-9294(01)07448-1
Language: English Document Type: Journal Paper (JP)
Treatment: Bibliography (B); Theoretical (T)
Abstract: The authors present a new system that integrates computer graphics, physics-based modeling, and interactive visualization to assist knee study and surgical operation. First, they discuss generating patient-specific three-dimensional (3-D) knee models from patient's **magnetic resonance images** (MRIs). The 3-D model is obtained by deforming a reference model to match the **MRI** dataset. Second, the authors present **simulating** knee **motion** that visualizes patient-specific motion data on the patient-specific knee model. Third, the authors introduce visualizing biomechanical information on a patient-specific model. The focus is on visualizing contact area, contact forces, and menisci deformation. Traditional methods have difficulty in visualizing knee contact area without using invasive methods. The approach presented here provides an alternative of visualizing the knee contact area and forces without any risk to the patient. Finally, a virtual surgery can be performed. The constructed 3-D knee model is the basis of **motion simulation**, biomechanical visualization, and virtual surgery. Knee **motion simulation** determines the knee rotation angles as well as knee contact points. These parameters are used to solve the biomechanical model. The authors' results integrate 3-D construction, **motion simulation** , and biomechanical visualization into one system. Overall, the methodologies here are useful elements for future virtual medical systems where all the **components** of visualization, automated **model** generation and surgery simulation come together. (64 Refs)
Subfile: A B
Descriptors: biomechanics; **biomedical MRI**; **orthopaedics**; physiological models; surgery
Identifiers: knee surgery assistance; patient model construction; **motion simulation**; biomechanical visualization; physics-based

modeling; interactive visualization; menisci deformation; invasive methods; virtual surgery
Class Codes: A8770G (Patient care and treatment); A8745D (Physics of body movements); A8710 (General, theoretical, and mathematical biophysics); A8760I (Medical magnetic resonance imaging and spectroscopy); B7520 (Patient care and treatment); B7510N (Biomedical magnetic resonance imaging and spectroscopy)

27/9/4
DIALOG(R)File 2:INSPEC

6606816 INSPEC Abstract Number: B2000-07-7620-003, C2000-07-7460-010
Title: Mathematical model of the simulation system with HWIL for infrared **imaging** homing missile
Author(s): Wang Xiao-Hu; Zhang Ming-Lian; Yang Xin
Author Affiliation: Beijing Univ. of Aeronaut. & Astronaut., China
Journal: Journal of System Simulation vol.12, no.3 p.214-18
Publisher: Editorial Committee of J. Systems Simulation,
Publication Date: May 2000 Country of Publication: China
ISSN: 1004-731X
SICI: 1004-731X(200005)12:3L.214:MMSS;1-5
Material Identity Number: H448-2000-004
Language: Chinese Document Type: Journal Paper (JP)
Treatment: Applications (A); Practical (P)
Abstract: In distributing precision of a simulation system with HWIL (hardware-in-the-loop) for infrared **imaging** homing missile, it is difficult to calculate precision sensitivity of each **equipment** to the **simulation** system with HWIL. The problem has been solved in this paper by establishing simulation models of the simulation system, doing simulation experiments and statistical estimating. According to the Second Newton Law, image manipulation technique and the national standard of **simulation equipment** , a general method and a principle of establishing simulation models of target simulator's 2-axis rotator; missile body attitude 3-axis rotator, load simulator, overloading simulator and infrared imagining system are put forward in this paper. Without linearizing the **movement model** of rigid body, meanwhile, the coupling between axes of the rotator and the influence of the infrared imagining technique are fully considered, resulting a more accurate, effective and common model. (3 Refs)
Subfile: B C
Descriptors: aerospace simulation; infrared **imaging**
Identifiers: mathematical model; simulation system; HWIL; infrared **imaging** homing missile; hardware-in-the-loop; precision sensitivity; simulation models; statistical estimating; image manipulation technique; missile body attitude 3-axis rotator; load simulator
Class Codes: B7620 (Aerospace test facilities and simulation); B7230G (Image sensors); C7460 (Aerospace engineering computing); C3360L (Aerospace control)

27/9/5
DIALOG(R)File 2:INSPEC

5480099 INSPEC Abstract Number: B9703-7620-004, C9703-7460-005
Title: U.S. Army Missile Command **Imaging** Infrared System Simulation (IIRSS)
Author(s): Buford, J.A., Jr.; Dunavant, T.S.
Author Affiliation: US Army Missile Command, Redstone Arsenal, AL, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.2741 p.69-80
Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 1996 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1996)2741L.69:AMCI;1-M
Material Identity Number: C574-96183
U.S. Copyright Clearance Center Code: 0 8194 2122 7/96/$6.00
Conference Title: Technologies for Synthetic Environments: Hardware-in-the-Loop Testing
Conference Sponsor: SPIE
Conference Date: 9-11 April 1996 Conference Location: Orlando, FL, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: The ability to thoroughly exercise and accurately predict the missile and/or submunition hardware and on-board software in a laboratory environment has always been preferred to reduce the number and costs of actual flight tests, to increase the probability of success of flight test using hardware-in-the-loop (HWIL) simulation, and help assure the U.S. Army is a "smart" buyer. The U.S. Army Missile Command (USAMICOM), responsible for providing all the simulation support for the U.S. Army's guided missiles and submunitions, has developed a HWIL Simulation Facility that supports several HWIL techniques including real time, closed-loop, "seeker-in-the-loop", "processor-in-the-loop", and "man-in-the-loop". This paper provides an overview of the development, operation, and usage of one such HWIL facility called the **Imaging** Infrared System **Simulation**. The major technological **components** used to develop the IIRSS are presented individually and integrated as an integration and performance-level HWIL system simulation. (12 Refs)
Subfile: B C
Descriptors: aerospace computing; aerospace simulation; aerospace test facilities; focal planes; infrared **imaging**; military computing; military systems; missile guidance; optical projectors; optical tracking; realistic images; target tracking
Identifiers: **imaging** infrared system simulation; hardware-in-the-loop simulation; HWIL Simulation Facility; real time closed-loop; seeker-in-the-loop; processor-in-the-loop; man-in-the-loop; performance-level HWIL system simulation; six DOF; flight **motion simulator**; simulation computer; computer image generator; IR projector; signal injection; missile seekers; IR seekers; control actuation systems; guidance sensors; EAI Simstar; Sensor Vision III; facility support equipment
Class Codes: B7620 (Aerospace test facilities and simulation); B7230G (Image sensors); B6140C (Optical information, image and video signal processing); B7950 (Military radar and tracking systems); C7460 (Aerospace engineering computing); C3360L (Aerospace control); C3375 (Military control systems); C6130B (Graphics techniques); C3240K (Image sensors)

27/9/6
DIALOG(R)File 2:INSPEC

5276817 INSPEC Abstract Number: A9613-8760I-009, B9607-7510B-054
Title: Simulation of **MRI** cluster plots and application to neurological segmentation
Author(s): Simmons, A.; Arridge, S.R.; Barker, G.J.; Williams, S.C.R.
Author Affiliation: Dept. of Neurology, Inst. of Psychiatry, London, UK
Journal: Magnetic Resonance Imaging vol.14, no.1 p.73-92
Publisher: Elsevier,
Publication Date: 1996 Country of Publication: USA
CODEN: MRIMDQ ISSN: 0730-725X
SICI: 0730-725X(1996)14:1L.73:SCPA;1-C
Material Identity Number: F149-96001
U.S. Copyright Clearance Center Code: 0730-725X/96/$15.00+.00
Language: English Document Type: Journal Paper (JP)
Treatment: Bibliography (B); Theoretical (T); Experimental (X)

Abstract: The advent of **magnetic resonance imaging** has provided new opportunities for volume measurement of tissues, with applications increasing dramatically in recent years. Cluster classification techniques have proved the most popular for volume measurement, yet little attention has been paid to how the choice of images for analysis affects the quality and ease of segmentation. To address this issue, we have developed a system to simulate **MRI** cluster plots using multicompartmental anthropomorphic software **models** of anatomy, and **components** for image contrast, signal-to-noise ratio, image **nonuniformity**, tissue heterogeneity, imager **field** strength, the partial volume effect, correlation between proton density, T/sub 1/ and T/sub 2/, and a variety of data preprocessing techniques. The effect of these components on tissue cluster size, shape, orientation, and separation is demonstrated. The simulation allows an informed choice of pulse sequence, acquisition parameters, and data preprocessing for cluster classification to be made as well as providing an aid to interpretation of acquired data cluster plots and a valuable educational tool. The system has been used to choose suitable images for neurological segmentation of grey matter, white matter, CSF, and multiple sclerosis lesions using spin-echo, inversion recovery, and gradient-echo pulse sequences. Constraints on image selection are discussed. (70 Refs)

Subfile: A B

Descriptors: biomedical NMR; brain; digital simulation; image classification; medical image processing

Identifiers: **magnetic resonance imaging** cluster plots; neurological segmentation; volume measurement; simulation; cluster classification techniques; multicompartmental anthropomorphic software models; anatomy; image contrast; signal-to-noise ratio; image nonuniformity ; tissue heterogeneity; imager field strength; partial volume effect; data preprocessing techniques; tissue cluster size; tissue cluster shape; tissue cluster orientation; tissue cluster separation; pulse sequence; acquisition parameters; acquired data cluster plots; grey matter; white matter; multiple sclerosis; spin-echo; inversion recovery; gradient-echo pulse sequences

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy) ; A8740 (Biomagnetism); A8770E (Patient diagnostic methods and instrumentation); B7510B (Radiation and radioactivity applications in biomedicine); B6140C (Optical information, image and video signal processing)

27/9/7

DIALOG(R)File 2:INSPEC

5094373 INSPEC Abstract Number: A9523-8750-003, B9512-7530-014

Title: Field distribution and loss due to **eddy** currents in cylindrical **models** of the human body

Author(s): Pantelakis, P.K.; Antonopoulos, C.S.; Kriezis, E.E.

Author Affiliation: Dept. of Electr. Eng., Aristotelian Univ. of Thessaloniki, Greece

Conference Title: EMC '94 Roma. International Symposium on Electromagnetic Compatibility Part vol.2 p.497-502 vol.2

Publisher: Univ. Rome, Rome, Italy

Publication Date: 1994 Country of Publication: Italy 2 vol. xvii+881 pp.

Conference Title: Proceedings of International Symposium on Electromagnetic Compatibility

Conference Sponsor: Nat. Res. Council; ENEA; URSI; SIP; ITALFERR-SIS T.A.V

Conference Date: 13-16 Sept. 1994 Conference Location: Rome, Italy

Language: English Document Type: Conference Paper (PA)

Treatment: Theoretical (T)

Abstract: The accurate estimation of the electric and magnetic fields inside the human body is of extreme importance, especially for the **MRI** conditions. A method based on the numerical method of moments is

presented, for determining the electric field and the eddy current density induced by a **nonuniform electromagnetic field** in a cylindrical shell. A method based on the diffusion differential equation for the magnetic vector potential is used for the validation of the results. The high frequency alternating magnetic field is produced by a saddle coil configuration or by several co-axial circular current loops. Numerical results are given for frequencies up to 60 MHz. A comparison of the two methods shows that they produce similar results which deviate greatly from the often used, quasi-static solutions. (9 Refs)

Subfile: A B

Descriptors: biological effects of fields; differential equations; eddy current losses; electric fields; electromagnetic field theory; magnetic fields; method of moments

Identifiers: eddy currents; field distribution; magnetic fields estimation; electric fields estimation; **MRI** conditions; numerical method of moments; eddy current density; diffusion differential equation; magnetic vector potential; high frequency alternating magnetic field; saddle coil configuration; quasi-static solutions; cylindrical models; human body models

Class Codes: A8750 (Biological effects of radiations); A4110F (Steady-state electromagnetic fields; electromagnetic induction); B7530 (Health Physics); B0290P (Differential equations); B5140 (Electromagnetic induction)